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CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

FIRST OF TWO SECTIONS

NOVEMBER 15, 1997

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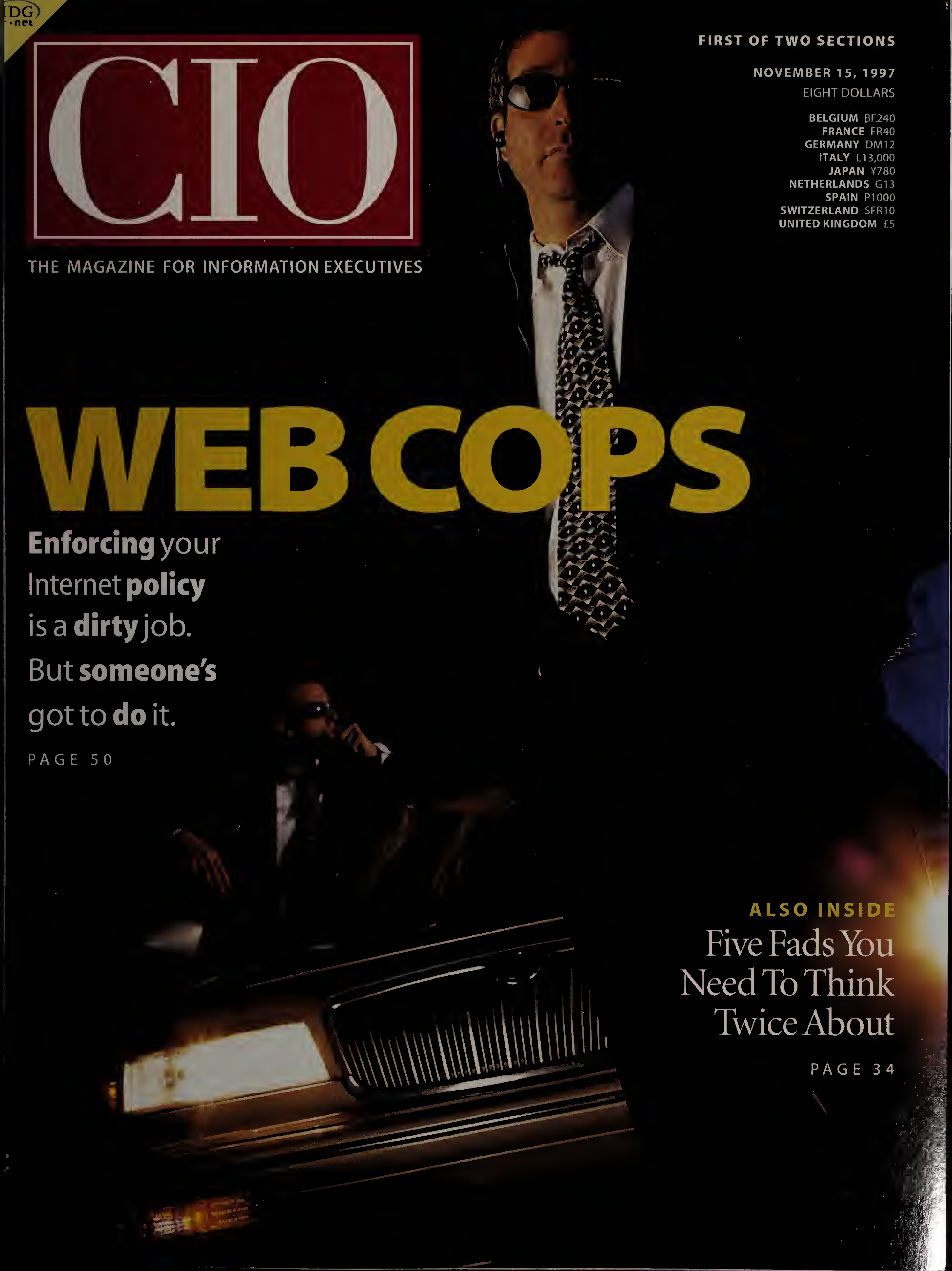

WEBCOPS

Enforcing your Internet **policy** is a **dirty** job. But **someone's** got to **do** it.

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ALSO INSIDE

Five Fads You Need To Think Twice About

PAGE 34

WHICH COMPUTER COMPANY MAKES A RELIABLE SERVER?

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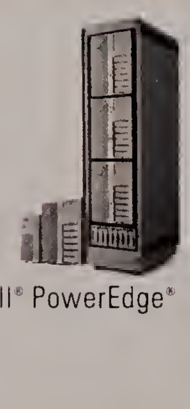

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CIO

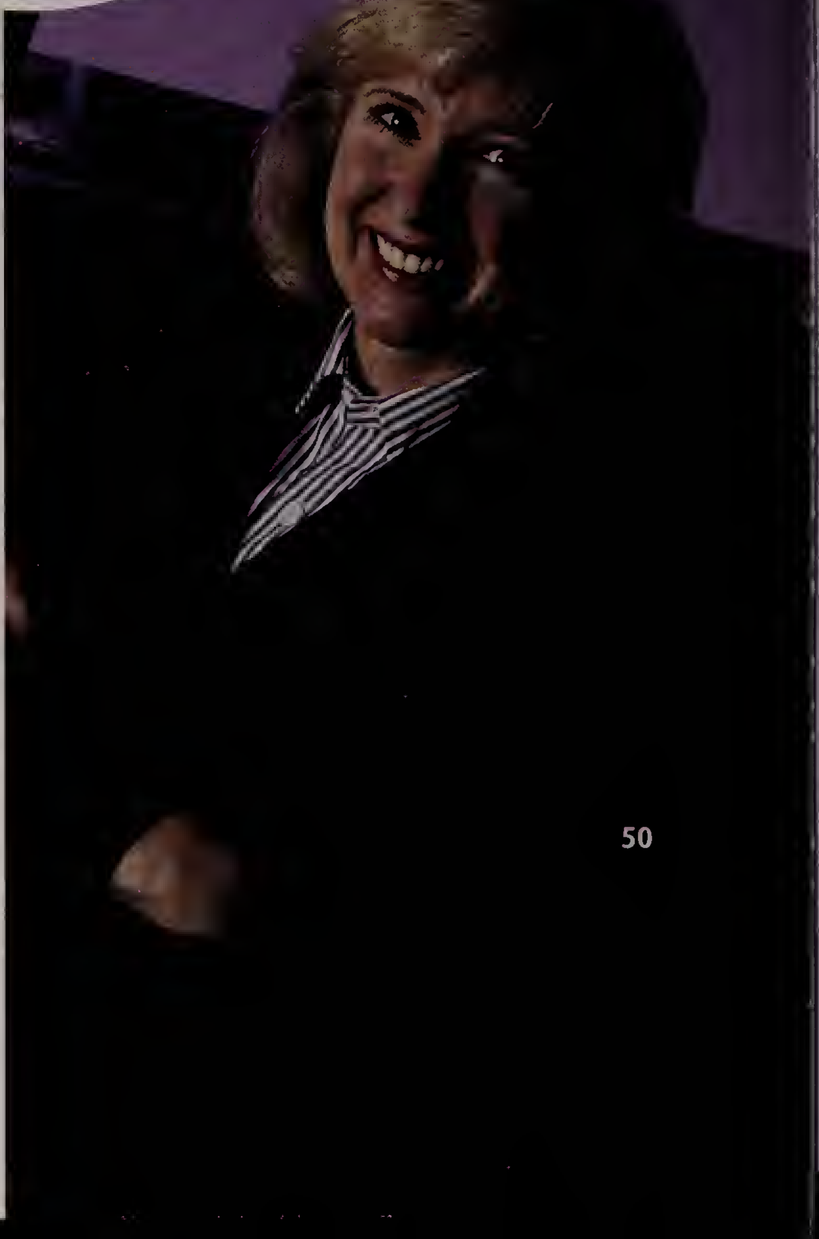
VOL. 11 • NO. 4 • NOVEMBER 15, 1997 • 154 PAGES IN 2 SECTIONS
SECTION 1

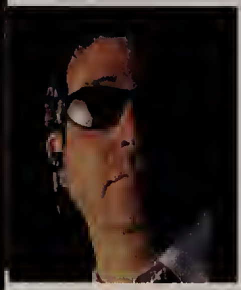
Features

34 **Five Uneasy Pieces, Part 3**
REALITY CHECK Co-opetition, enterprise resource planning software, IT/business alignment, secure electronic commerce and push technology should be approached with, if not outright skepticism, at least a healthy dose of common sense.

50 **Web Cops**
COVER STORY: NETWORK MANAGEMENT Policing employees' Web access may be distasteful, but if you haven't looked to see whether workers are frittering away productive time or misusing company assets, laying down the law may pay dividends.
By Tom Field

60 **Group Efforts**
CAREER DEVELOPMENT In the ever-changing world of IT, CIOs find a roundtable of their peers is the best place to get both information and advice.
By Mindy Blodgett





ON THE COVER:

It's 9 a.m. Do you know where your employees are surfing?

Cover photo by Webb Chappell

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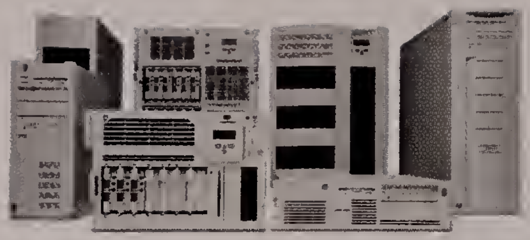

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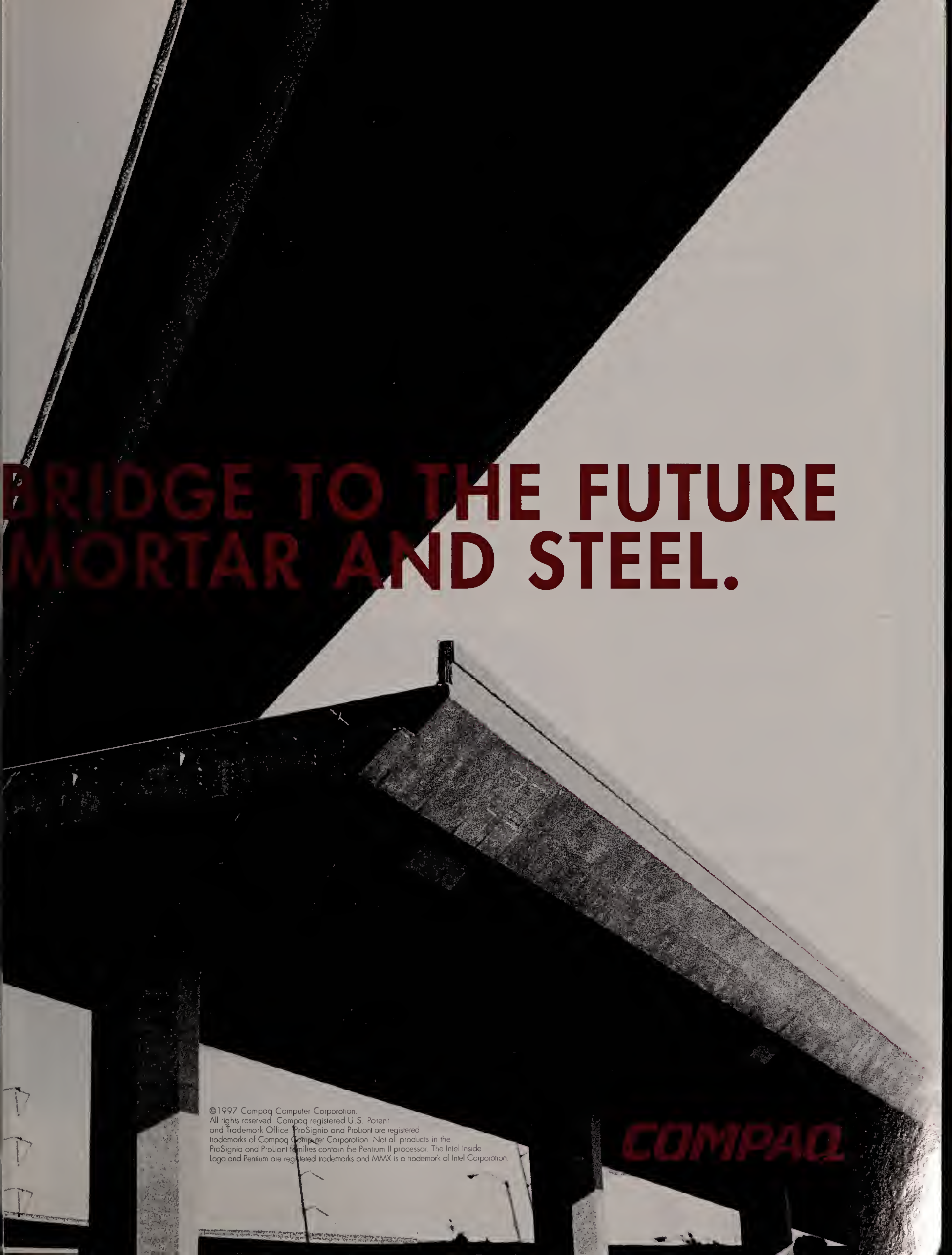

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CIO

Columns

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META VIEW To provide Web access to data warehouses, you'll have to explore the terrain beyond the beaten track. *By Aaron Zornes*

68 Storage Starts to Sizzle

EMERGING TECHNOLOGY The proliferation of data has many an IS department scrambling for greater capacity. *By Derek Slater*

Rentable software • Networking PCs • Applications testing

Data encoding

80 Texas Health Resources

WORKING SMART Through its use of an automated program, one state's health-care organization reduced the time and cost involved in matching job candidates to open positions. *By Debby Young*

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Inside Section 2

COVER STORY: ORGANIZATIONAL INNOVATION The quest for speed is part of the corporate culture at Honda of America. It also happens to make good business sense.

BUSINESS METRICS Benchmarking won't reinvent your company, but it will show you how to improve bit by bit.

DATA WAREHOUSING The inside story of a fatally flawed data warehouse project.

BUSINESS MODELS Have you scrutinized your business model lately? Unless you can anticipate shifts in customer values, you're destined to become obsolete.

REALITY BYTES The year 2000 problem. What problem?

INTELLECTUAL CAPITALISM An overview of knowledge management software and services.

CHECKS & BALANCES Returns on technology investments should be far from fuzzy. If benefits can be observed, they can be counted.

LEARNING CURVE Groupware has its share of naysayers and proponents. The latter group believes it encourages collaboration and provides a framework for teamwork.

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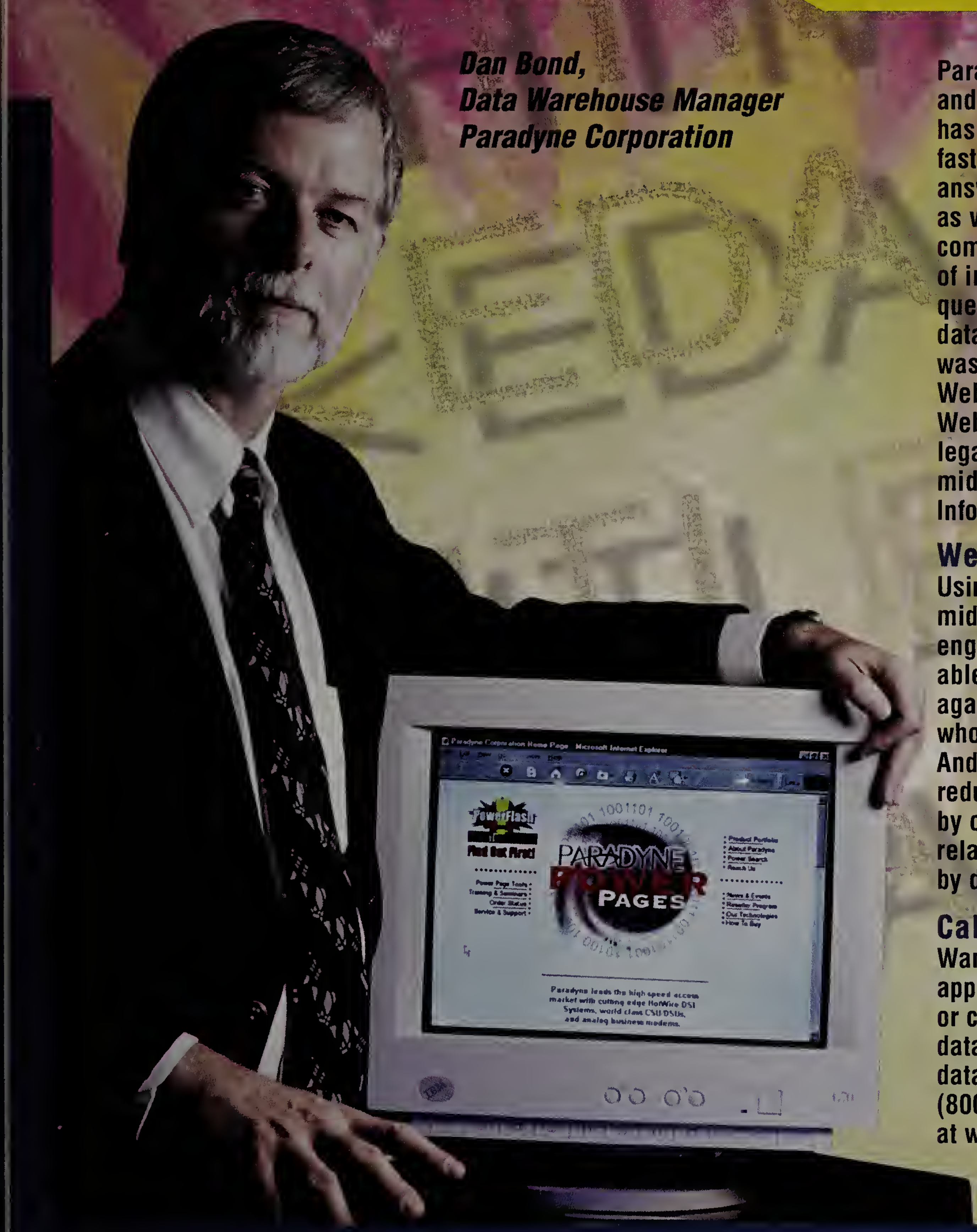

"Our customers were on the Web. Our data was on the mainframe. Our solution was call The Builders."

Dan Bond,
Data Warehouse Manager
Paradyne Corporation

Paradyne Corporation, a pioneer and leader in digital network access, has customers who not only want fast network access, they want fast answers on the status of their orders as well. And that used to mean the company had to process thousands of individual phone calls and manual queries against mainframe transaction data. The company knew the answer was a self-service application on the Web; but how could they integrate a Web reporting system with mainframe legacy data? The answer... EDA middleware and WebFOCUS from Information Builders.

Web Access to Legacy Data

Using Information Builders EDA middleware and WebFOCUS reporting engine, Paradyne customers are now able to launch dynamic queries against live mainframe data. The whole system was built in 90 days. And in less than two months Paradyne reduced order status telephone calls by over 40%, enhanced customer relations, and stimulated new business by driving customers to its Web site.

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In Box

LETTER FROM THE EDITOR, READER FEEDBACK AND HOW TO REACH US

> *"At Astra Merck, technology planning is not a separate activity. It has become a natural part of the process as businesspeople think about how their area can function more effectively."*
>
> **–Rob Cohen**
> *VP of IT and Capabilities & CIO*
> *Astra Merck Inc.*

> *"The CIO is part of our five-member officer group. Every major strategic decision involves him. Very rarely does anything go on in the company where [CIO] Dean Sivley and his group are not a part of the formulation and the direction."*
>
> **–Hal Rosenbluth**
> *President and CEO*
> *Rosenbluth International Inc.*

Alignment. It's the number-one issue on Computer Sciences Corp.'s annual survey of top IS issues (and has been either number one or number two for most of the past 10 years). It's a term that's constantly bandied about by consultants, in the IS management press and on the conference circuit. Personally, I think the alignment concept is pretty retro.

To me, alignment means you find out what the business plans are and then devise your IT plans to match. The problem with this approach is speed. By the time you've delivered, chances are the business has moved on to something else. In fact, to set alignment as a goal in all but the slowest-moving organizations is to set yourself up for failure. (For a cold, hard look at the pros and cons of alignment and other popular business and technology trends, please see "Five Uneasy Pieces," Page 34.)

You've got to reach higher. Leading companies today are going for IT/business integration. When I spoke with the CEO/CIO teams from the two companies quoted above (for October's *CIO Enterprise*, in case you missed it), I was struck by the level to which these organizations had achieved true integration of their IT/business planning. At both companies, the CIO is a member of the senior executive team. The technology staff is fully involved in business-focused planning groups. IS weaves in and out of business operations at every level of the organization.

Hey, alignment is better than nothing. But if you think it's enough, you've got another think coming.

What are your thoughts on alignment? Have you achieved it? What does it mean to you? Do you think I'm just getting hung up on semantics? Send your comments to me or to *letters@cio.com.*

Abbie Lundberg
lundberg@cio.com

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In Box

A LEADING ROLE
If the idea behind your "heroic art" cover [Sept. 15, 1997] was to show the past pecking order of what has been a stilted, paternalistic profession, you succeeded. Instead of showing yuppified white males leading black males, white females and doddering old white guys (my peer group), why not take a leadership role in breaking up the old stereotypes? Just as the use of certain language speaks volumes, so does the choice of art, particularly cover art.

Pat Mente
Manager, HR Systems and Payroll
GTE Directories Corp.
Dallas/Fort Worth Airport
pat.mente@gtedc.gte.com

The art is meant to show all the people in a heroic role. The young white man is not meant to be leading the others.

SOFTWARE: FOR THE BIRDS
Your comments on disconnecting were profound [In Box, Sept. 1, 1997], and for a brief moment I left my office (metaphorically, of course). I was at once reminded of an episode this past summer, where I was explaining to my friend in Michigan about the new software available for bird watching. He paused for a time, then commented, "Why not just go out and see them?"

I couldn't answer.

Mike Gollnick
gollnickm@panasonic.com

HELPFUL YEAR 2000 HINT
I have proposed an idea that my company will execute in about a half-year's time. I thought you could pass it along to your readers.

We have PCs, programmable controllers and servers strewn about the corporation. The cumulative exposure is greatest among these types of systems. We have agreed that on April 1, 1998, all of our systems except the midrange business systems (AS/400s) will be set with a clock date of April 1, 2001.

This gives us a day to run on the new date and discover in advance what works and what doesn't work. The date we chose is also significant. April Fools' Day is internationally recognized, according to my overseas offices. E-mail leaving the company with the wrong date will be perceived as good fun instead of bad computing. On April 2, we will know what systems didn't work and can plan an appropriate upgrade path.

David Kolstedt
CIO
Memtec
Timonium, Md.
dkolstedt@memtec.com

KIND WORDS
I read your wonderful magazine cover to cover on airplanes and in hotels, and I never remember to acknowledge your team of editors and writers. The design and the layout really make it stand out from all the other trade magazines I get. It's the most sought-after magazine in my office, so I always have to go looking for it, and when I do find it, it has coffee stains and the pages are curled up. That's an indication you're doing a really good job. Keep up the good work!

Jimmy A. Castro
Greater Austin Chamber of Commerce
Austin, Texas

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Publisher's Note

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>
> **–Bill Hancock**
> *Executive Vice President & CTO*
> *Network-1 Software and Technology Inc.*

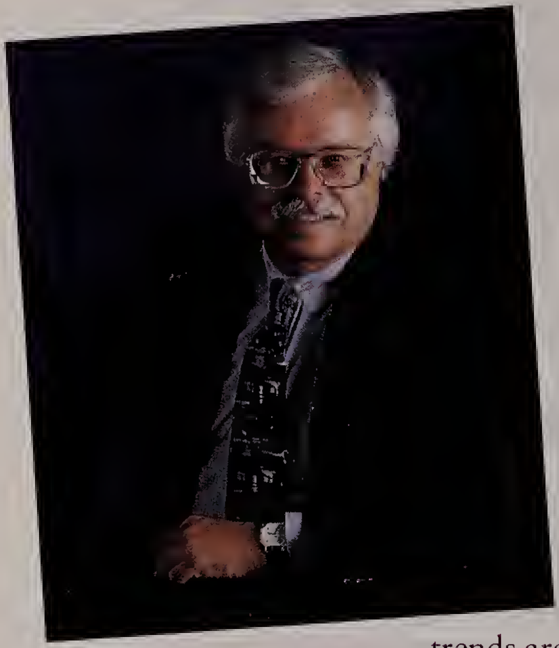

PHOTO BY WEBB CHAPPELL

Like old 45s, every hyped technology and trend has a flip side—the side you rarely hear. Now is the time to check out the "B" side of technology bandwagons that are running rampant. In "Five Uneasy Pieces" (Page 34), *CIO* takes a critical look at co-opetition, ERP software, secure electronic commerce, IT/business alignment and push technology.

Typically, these technologies and trends are portrayed as panaceas. Your CEO reads about one of them in an airline magazine and the next thing you know, there's a copy of the article in your inbox with the words, "let's do this" circled in red. So what do you do?

Take a deep breath and start reading the pros and cons. Clearly, all of these trends could provide benefits and a competitive advantage in most corporate enterprises. The key is to separate the wheat from the chaff—and use what's right for your environment. Collect the facts. Talk to your peers. Scrutinize trends and new technologies, and determine if they fit your corporate culture. The one thing a hot technology generates is change—and some organizations can't take the heat.

"Five Uneasy Pieces" offers a starting point, with a look at the promises and pitfalls of these five technologies. After reading it, you can route a copy of the article to your CEO with the words, "let's talk about this" circled in red.

P.S. Beautifully crafted hard-bound commemorative 10th anniversary editions of *CIO* can be yours. They make perfect gifts for clients, employees, colleagues or even yourself. For more information, call Denise Perreault at 508 935-4443 or e-mail her at *denisep@cio.com*.

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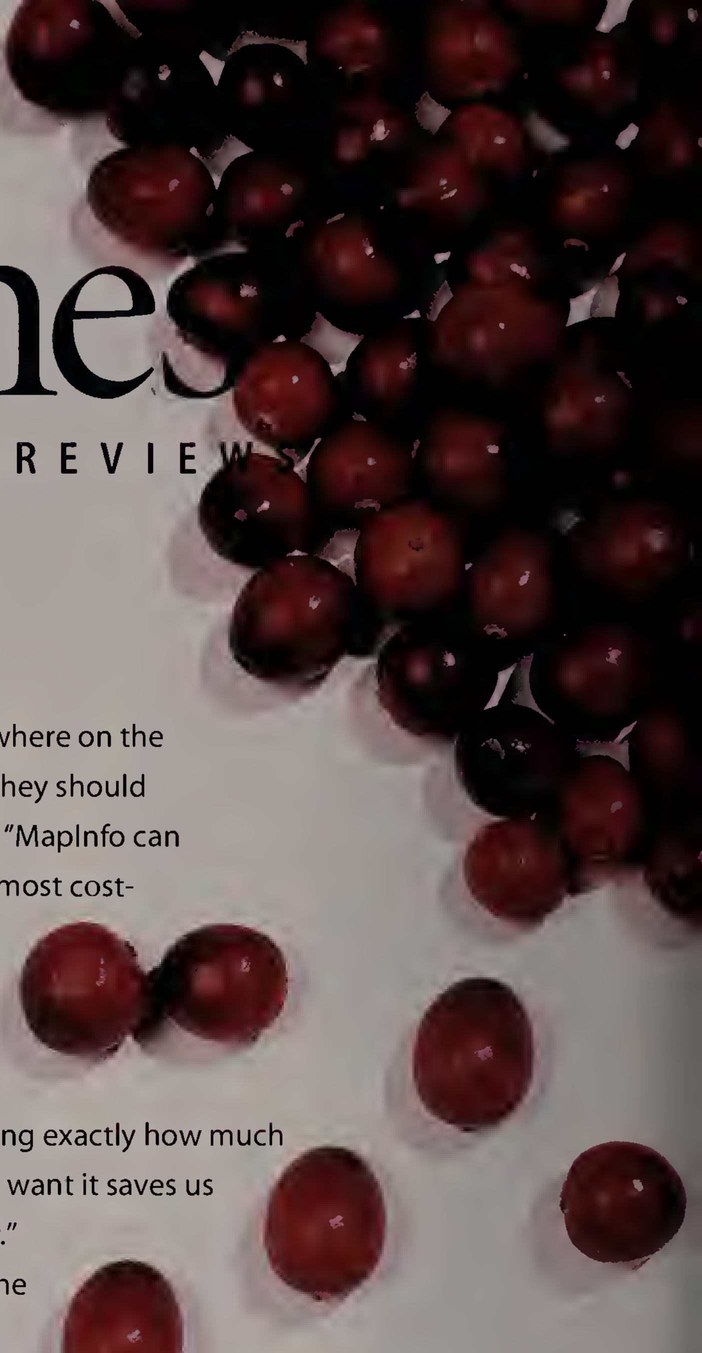

Trendlines

NEWS, INSIGHT, HUMOR, REVIEWS

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Mapping Berried Treasure

HIGH-TECH AGRICULTURE As you drop a dollop of cranberry sauce on your plate this Thanksgiving, remember to give thanks for the mapping technology that made it all possible. Gone are the days when cranberry growers were content to let nature take its course. Now technology-savvy bog owners maintain meticulous databases to keep track of factors such as weather, soil quality, fertilizer applications and annual yields.

Beaton Cranberry Growers Service Inc. of Wareham, Mass., the world's second-largest cultivator of cranberry bogs, uses customized desktop mapping software from MapInfo Corp. to track crop growth rates and monitor the yields of different berry varieties using data gathered over a number of years. Beaton also uses MapInfo to give workers specific instructions. For example, helicopter pilots get detailed maps that tell them where on the 1,200 acres Beaton manages they should spray fertilizer and pesticides. "MapInfo can help us find the quickest and most cost-efficient way to apply fertilizers by helicopter," says Deborah Beaton, the company's information specialist. "Knowing exactly how much we want to use and where we want it saves us material and improves quality."

Tourists who come to see the Beaton berries during harvest season reap the rewards, too: They can get a digitized image of the crops with directions that guide them to the bogs being picked that day. ■

What a Gas!

SERVICE STATION INNOVATIONS Time was when a trip to the filling station was a simple proposition. You bought some gas, perhaps pumped some air into your tires, maybe washed your windshield. Now, some giant oil companies are striving to make that trip to the local service station much more than a chance to fuel up.

Shell Oil Products Co., based in Houston, is field testing an automated fueling system called Shell Smart Pump that uses robotic technology to dispense fuel without the help of an attendant and without requiring the customer to leave the car. The service, which Shell customers in Sacramento, Calif., can try, works a little like a drive-up automated teller machine. To use it, the customer needs to do two things first: Attach to the windshield a transponder that will give the pump information about the car and replace the original fuel cap with one that has a spring-loaded slot. Then the customer can just pull up and punch in the type of gas desired and method of

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Intel Tech Buzz

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Networked computing environments based on the Intel architecture play a critical role in business agility. However, the very traits that make those environments so powerful—the breadth of hardware and software choices, the growth in desktop capabilities, the explosion of the Internet—also make them more challenging to manage and control.

CONTROL CAN MEAN THE DIFFERENCE BETWEEN A BUSINESS THRIVING AND MERELY SURVIVING.

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"When deployed in combination with manageable HP Vectra and Net Vectra PCs, and leading desktop management tools, we anticipate that the WfM specification will enable organizations to significantly reduce PC ownership costs."

*John Gannon, GM
Commercial Desktop Div.,
Hewlett-Packard Company*

"Highly manageable, WfM-enabled PC platforms, combined with system software solutions and good technology management practices, should help customers significantly lower their cost of ownership."

*Eric Harslem, Sr VP
Products & Tech. Strategy,
Dell Computer Corporation*

"Through our IBM/Intel Advanced Manageability Alliance, we are working to define industry standards, and are already shipping robust WfM-enabled IBM PCs with IBM Wake on LAN™ technology. This helps our customers to lower the cost of managing their networks."

*Anne Gardner, VP
Commercial Desktop
Systems, IBM*

"The features, services, and partnerships associated with Compaq's Intelligent Manageability, along with the baseline WfM capabilities, continue to lead the industry in the delivery of standards-based, manageable PCs that reduce the total cost of ownership."

*Tim Harris, VP
Desktop PC Division,
Compaq*

industry leaders to ensure that Intel architecture environments offer not only the most powerful array of business capabilities, but the most manageable. We've spearheaded an industry-wide effort to develop guidelines for a new generation of platforms—designed from the ground up for manageability—to be centrally managed over the network. Now, systems based on those guidelines are coming to market, and they deliver a rich set of capabilities for managing and controlling the computing environment.

With our **LANDesk® Management Suite**, we offer a comprehensive set of software tools that can automate tasks ranging from software distribution and virus protection to inventory control and asset management. LANDesk family products also provide remote management features that help IT reduce total cost of ownership (TCO) and increase agility by automating and centralizing management functions.

Manageability rests on more than just products—but products are a good start. By deploying PCs, Net PCs, and servers based on the Pentium II processor and the Wired for Management baseline, companies are better positioned to increase manageability. Add industry-leading management software such as the LANDesk family, and companies are further able to reduce their total cost of ownership, enhance business agility, and thrive in a world of ongoing change.

Manageability is just one element of business agility. Watch for future *Tech Buzz* issues to bring you up-to-date information on other ways to make your business more agile.

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Wired for Management-capable PCs and Net PCs can help your IT organization increase service levels, reduce support costs, and boost the ability to deploy new capabilities quickly. They do this by enabling down-the-wire remote management that delivers benefits in four key areas:

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The net effect? Network uptime, user satisfaction and business agility go up. Support costs and TCO go down.

www.intel.com/techbuzz

This is just a glimpse of the technologies behind increased manageability. For more detailed information, visit our Web site.

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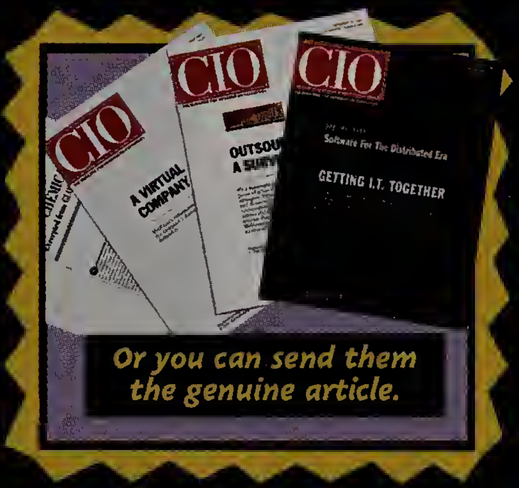

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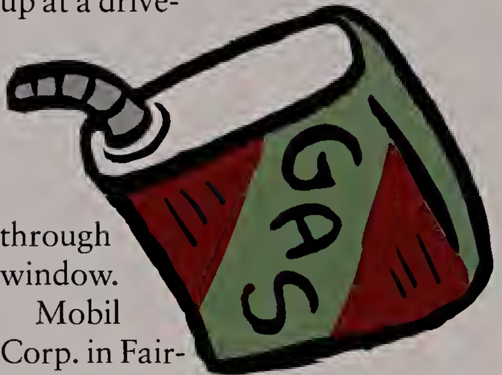
GENUINE REPRINTS FROM CIO

CIO Communications Inc. • An IDG Company • 492 Old Connecticut Path • Framingham, MA 01701 • 508-872-0080 • http://www.cio.com payment. The "smart pump" identifies the make and model of the car and uses a robotic arm to open the fuel door and pump the gas. Shell claims the whole process takes only two minutes.

Shell is also testing the Shell Pump Shopper system in Sacramento and in the Sarasota, Fla., area. The system works like this: Consumers pull up to pumps equipped with interactive touch screens that allow them to pay for gas as well as order groceries from the service station convenience store. Purchases are either delivered to the car by Shell attendants or are available for pick-up at a drive-through window.



Mobil Corp. in Fairfax, Va., has already introduced the Mobil Speedpass, a device aimed at speeding up payment at the pump. Customers simply wave a miniature electronic wand, available at participating Mobil stations, in front of designated pumps. They can then fill their tanks and be on their merry way—without ever having to reach for their wallets. The Speedpass, which relies on a radio frequency signal system, comes with a keychain tag containing miniature transponders preprogrammed with an identification number. While a customer pumps gas, the Speedpass system communicates with Mobil's centralized credit department, which charges the gas directly to the customer's credit card. This year, Mobil hopes to distribute 1 million Speedpass key tags to customers nationwide.

–Mindy Blodgett

Off the Shelf

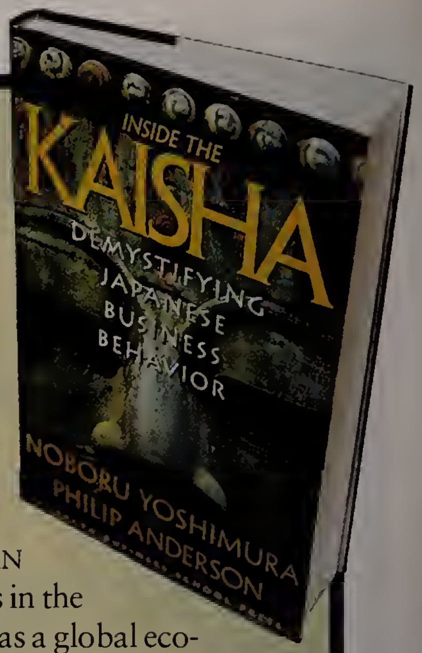


PHOTO BY VITO ALUIA

East Meets West, Again

Inside the Kaisha: Demystifying Japanese Business Behavior
Noboru Yoshimura and Philip Anderson
Harvard Business School Press, $24.95

WESTERN COMPANIES HAVE BEEN TRYING TO LEARN about the business practices of their counterparts in the Land of the Rising Sun since Japan first emerged as a global economic powerhouse. But just when it seems the West has a handle on Japanese companies, they turn around and disprove every theory—laying off employees, for example, when lifetime employment is supposedly one of their core tenets. Or they give the appearance of an egalitarian culture in what is really a hierarchical organization of yes-men. Such apparent contradictions become clear when one understands the *kaisha*—the large Japanese corporation.

Plenty of books try to explain Japanese corporate behavior, but authors Philip Anderson, an associate professor of business administration at Dartmouth College's Amos Tuck School of Business Administration, and Noboru Yoshimura, a vice president of Bankers Trust in Tokyo, argue that most fail because they view Japanese business behavior only as an outgrowth of the nation's culture. *Inside the Kaisha*, on the other hand, looks to cultural elements within the company itself to explain the seeming inconsistencies that so frustrate Western companies.

For example, if Westerners understand the importance of context to Japanese businesspeople, the apparent double standard of giving lifetime employment for Japanese workers but not for their American counterparts makes perfect sense: Americans, even those who are employees, are almost always outsiders and thus subject to different treatment than Japanese members of the corporation. Of course, this may sound like outright racism, but taking offense at Japanese ways won't yield insight into the motivation for their actions. "A person who wishes to understand why [Japanese businesspeople] behave the way they do must not become so focused on the Japanese-verus-*gaijin* (foreigner) distinction that he overlooks a deeper mechanism governing Japanese business behavior," write the authors. "Japanese people do apply different standards to insiders and outsiders, but from their perspective no duplicity is involved—why should one treat apples and oranges the same? To predict Japanese behavior, try to understand who in a given situation will be framed as an insider and who will be considered an outsider."

Another cultural characteristic shared by Japanese workers is the overarching fear of embarrassment, which helps explain why the same *kaisha* is sometimes innovative and bold, and other times stiflingly conservative and imitative. In normal situations, Japanese businesspeople are paralyzed by the fear of embarrassment and hence are not likely to take risks. At the same time, they don't want the company to be embarrassed by its competitors. So when the *kaisha* is in danger of being shown up, Japanese businesspeople suddenly launch into innovation overdrive. Understanding this can help Westerners predict the actions of Japanese competitors or learn how to goad Japanese employees into thinking creatively.

If readers can get past the fact that this is yet another book about the somewhat overexposed topic of enigmatic Japanese business behavior, this book is worth the time. *Inside the Kaisha* offers real-life examples and advice. But what makes it most valuable is Yoshimura's insider perspective—a rare coup in a country where people rarely talk about their companies for fear of embarrassing themselves and their employers.

–Jennifer Bresnahan

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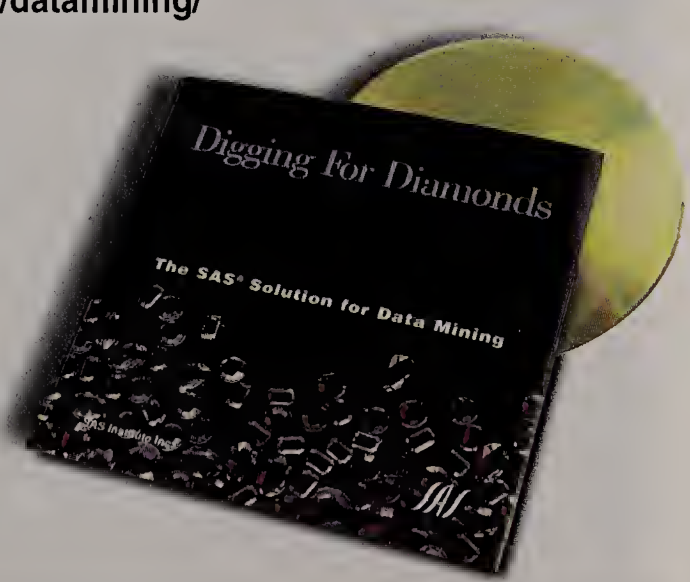

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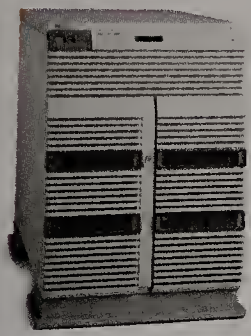

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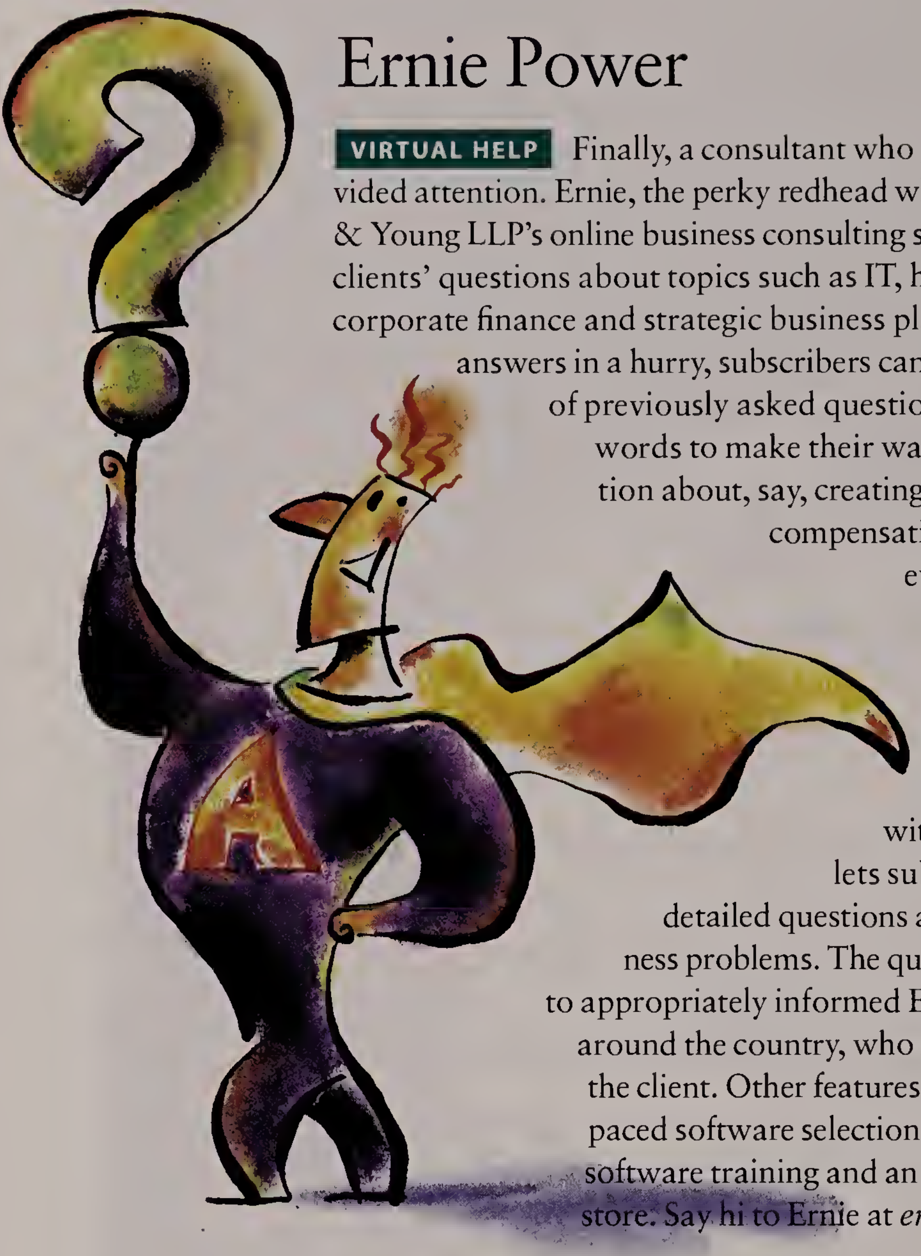
Trendlines

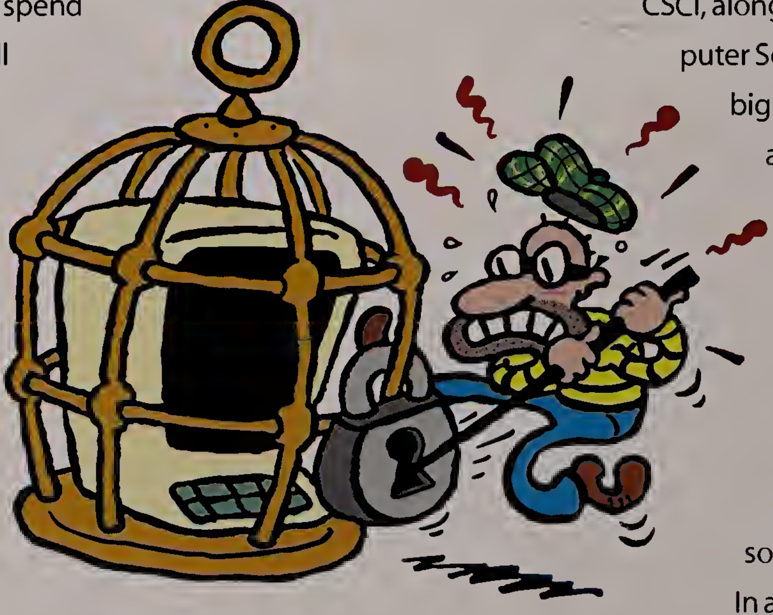
Ernie Power



VIRTUAL HELP Finally, a consultant who gives you his undivided attention. Ernie, the perky redhead who represents Ernst & Young LLP's online business consulting service, responds to clients' questions about topics such as IT, human resources, corporate finance and strategic business planning. To get answers in a hurry, subscribers can access a database of previously asked questions, using keywords to make their way toward information about, say, creating incentive-based compensation programs or evaluating a business's net worth. For more personalized service, the site offers "Dialogue with Ernie," which lets subscribers submit detailed questions about their business problems. The questions are routed to appropriately informed E&Y consultants around the country, who respond directly to the client. Other features include a self-paced software selection advisor, desktop software training and an online computer store. Say hi to Ernie at *ernie.ey.com*. ■

> **"A lot of this is foo foo and la la. These visions only make sense within the Silicon Valley 408 and 415 area code space time continuum differential shift."**
>
> **–Geoff Goodfellow,** *founder and former CEO of RadioMail Corp., a provider of mobile data solutions, on the proliferation of consumer-oriented data delivery services such as Internet access via cell phones.*
>
> SOURCE: THE NEW YORK TIMES INTERACTIVE, OCT. 6, 1997

Hacker Attack Facts



SECURITY BREACHES Having trouble convincing the powers that be of the need to spend money on firewall protection? Tell them to drop the purse strings, grab a browser and check out a selection of mangled Web sites preserved for all time by the folks at Computer Security Canada Inc. (CSCI) of Ottawa. Viewing the original and hacked pages of such unlucky organizations as the U.S. Department of Justice, the CIA and Kriegsman Fur, all of which were subjected to most unsavory alterations by ambitious and apparently very opinionated hackers, should be enough to send even the staunchest disbelievers scurrying for network protection.

CSCI, along with the U.S.-based National Computer Security Association, finds security holes big enough to allow hackers easy access on at least 80 percent of the sites they audit. "Computer hackers are a serious threat to the integrity of every organization with a network hookup," says Nahum Goldmann, CEO of CSCI. "These are not pretty pictures." For that reason, the company offers this warning: "All [pages] are uncensored, so shield your children."

In addition to pictures of hacked sites, CSCI has a "Hackers Hall of Fame," detailing the exploits of the world's most notorious computer bad guys. Visit the company at *www.csci.ca*. ■

ILLUSTRATION ABOVE BY BETHANY GULLY; BELOW BY DAVID BRION

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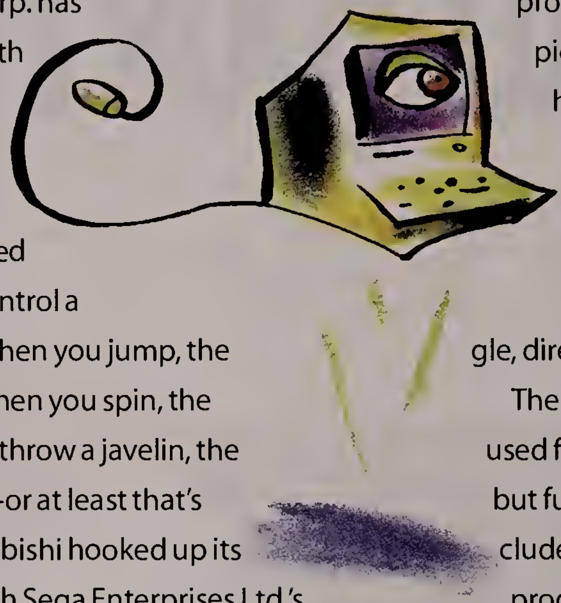
Imitation Innovation

VIDEO GAMES If you yearn to establish a stronger connection with your video game alter ego, you're in luck. Mitsubishi Electric Corp. has refined a digital camera with an artificial retina that not only watches and recognizes your every twist and gesture but, when connected to a game machine, can control a character's movements. When you jump, the screen character jumps; when you spin, the character spins; when you throw a javelin, the character does the same—or at least that's how it worked when Mitsubishi hooked up its newest game interface with Sega Enterprises Ltd.'s "Decathlete" for a 10-event virtual Olympics.



The artificial retina chip module consists of a lens, pixel core circuits that pick up light and images, and a 16-bit processor that allows the retina to "see" 100 pictures per second—fast enough to allow hand gestures to control a game of Tetris. The software requires a vision algorithm that recognizes a person's motions in real-time and can calculate size, tilt angle, direction and speed.

The technology is currently used for multimedia games, but future applications include security systems and programs to assist people with disabilities. ■

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Meta View *Edited by Perry Glasser*

INDUSTRY ANALYSIS FROM THE RESEARCH COMMUNITY

Off-Road Access

To provide Web access to data warehouses, you'll have to explore the terrain beyond the beaten track

BY AARON ZORNES

NOT TOO LONG AGO, THE Social Security Administration (SSA) gave the public access to its data via the Internet. The move was more than a means of saving taxpayers' money, however. The SSA hoped to give citizens the precision and speed of self-service when seeking the same information they were previously able to obtain only by telephone, letter or personal visit to any SSA office. The administration placed standard safeguards online to manage entry to its data warehouse via its Web site. All citizens had to do was key in the same personal data that a request through the U.S. mail would require: Social Security number, date of birth, mother's maiden name—the usual suspects in this digital age.

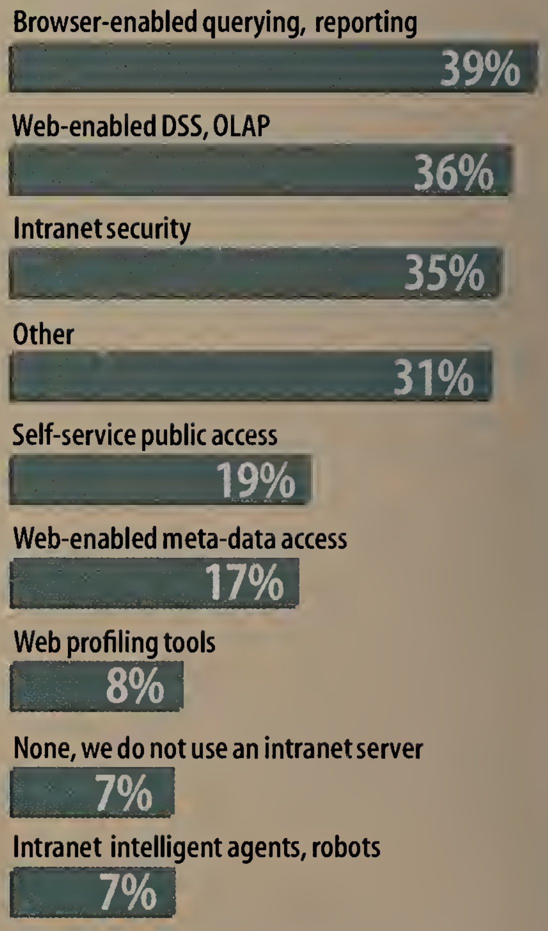
The SSA had done everything right. The system worked. Citizens' privacy was as private as ever. But within nanoseconds of the SSA's proud announcement of the site's existence, the brave exploration that blazed an off-road shortcut from the familiar path of business as usual was halted. The problem was not the technology; the problem was the culture. Too few citizens perceived the Web-enabled system to be secure, the perception became the political reality and the ensuing public relations nightmare demanded real-world action. By congressional order and tabloid incitement, Web access to the SSA was simply shut down.

In the private sector, the common perception is that Web access to enterprise data warehouses is a solution to business problems that can be tackled with decision-support systems (DSS). The arguments for its adoption are compelling: ease of use for both internal and external customers, ease of deployment and the compelling economics of a dynamic system that dramatically reduces costs when compared with private networks or EDI. Indeed, by the turn of the century, the Internet will serve as the primary decision-support platform for both intra- and extra-enterprise applications. A July 1997 Meta Group Inc. survey of 1,200 attendees at the DCI Data Warehouse World conference in New York revealed that the majority plan to buy Internet/intranet data warehouse access tools in the next year (see "Market Demand," this page).

So unlike the hapless SSA, private sector information executives seem ready to become off-road data access pioneers. "Customer-centricity" is a key business imperative driving the move to Web-enabled data warehouse access by such industry-leading IT adopters as Alamo Rent A Car Inc., American Express Co., BankAmerica Corp., The Boeing Co., Federal Express Corp. and MasterCard International Inc. Clearly, providing an overall higher level of customer service is acknowledgment that a uniform customer interface combined with self-service access provides the best competitive business advantage. A second business imperative is that partners of the enterprise will demand "closed-loop decision support" among the various processes in the customer relationship chain. In other words, as more, superior information about customers is learned because of their interactions with a database, business processes will be revised. Those processes will glean even better information and will be even more finely honed, creating an

Market Demand

Companies are actively investing in Web access to data warehouse tools



SOURCE: 1,200 DATA WAREHOUSE DECISION MAKERS POLLED BY META GROUP RESEARCH

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information loop that will spiral best practices ever higher.

Stuck in Traffic

But as much as the choices seem a no-brainer, Web access to data warehouses—despite their proliferation—has been slow to evolve. This is partially due to the "fat" client or "desktop-centricity" of many Web-enabling tools, resulting in a lag to market for scalable solutions. (This is changing, with the near-term release of reengineered server-enabled versions of popular desktop OLAP and relational OLAP tools.) Although providing access to data warehouses via the Web introduces critically needed solutions such as software deployment across an enterprise, it also presents many pitfalls—for example, the "turnpike effect," when users quickly overwhelm the infrastructure after it's made available to the general public. Another inhibitor to the growth of such access to data warehouses is that most Web-enabled DSS products produce static reports. In pursuit of a more dynamic environment, ROLAP vendors such as Information Advantage Inc., Informix Software Inc., MicroStrategy Inc., Microsoft Corp., Oracle Corp. and Platinum Technology Inc. have added server-based architectures in "Web-lite" versions of their products this year.

Deploying off-road access to internal company data requires attention to both IT and cultural issues.

Recent approaches to Web-enabled DSS have not proved ideal. For example, browser plug-ins that make possible the reading of server-posted reports and file transfer protocol (FTP) data downloads allow feature-rich full clients and local manipulation of data. However, they omit ad hoc query tools, do not allow self-service access and make HTML scrolling impossible since no HTML browser viewing is available until the data downloads. Further, a lack of hyperlinks in downloaded reports means users find themselves at an associative dead end. A second approach, ROLAP-style Web "drill outs," allows a true thin client that provides basic OLAP function. But a thin client's primitive interface requires users to fill out forms and forces graphics to arrive at the desktop as slow-loading GIF files that offer no interactive manipulation and provide only minimal ad hoc querying.

Road Work Ahead

What will it take to make data warehouse access via the Web a working reality? Just how far should forward-thinking information executives be willing to drive off-road to create new highways? Before making that turn off the main road, look for "server-ized"—or Web-savvy—business intelligence products with the following fundamental capabilities:

- **Self-service data access.** Autono-

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ONCE UPON A TIME, THERE WAS
AN I.S. MANAGER WHO PLEADED FOR
BETTER NETWORK COVERAGE
THAN A 24-HOUR CABLE NEWS
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mous query, reporting and OLAP-style analysis will be expected by users of desktop DSS tools. IT staff-developed reports and static OLAP cubes, or data warehouse containers of information, will be deemed insufficiently robust. Users will continue to expect their IS-supplied desktops to match the look and feel of personalized bookmark-style browsers for access to both internal and external information sources. Self-service data access by browsers should provide a "hyperdrill" capability to any Web data source while enabling users to "publish and subscribe" for regular distribution of reports and updated OLAP cubes. Meta Group believes the next step will be channel-level broadcasting à la PointCast so that users can, for example, tune in to a "channel" for sales reports.

■ **High availability and performance.** To create smooth Web access to data warehouses, a multitier architecture based on a distributed-component architecture will be superior to a single server architecture. Enterprisewide or public access levels to a database require close attention to scalability via load balancing and server fail-over. Load balancing automates the intelligent distribution of workload among the servers on a network; server fail-over provides a similar service should a server fail. These key performance-related features are found in contemporary relational databases but not in most server implementations of DSS servers. In addition to these capabilities, efficient network and server use will require new capabilities such as the following:

1. Support for archived or disk-resident Java applets;

2. HTML vertical scrolling and "next page" scrolling (as with AltaVista's Next hyperlink);

3. Query governors to limit the amount of data transferred over a network and the amount of time a query can run in order to prevent a rush-hour effect and other overloads.

■ **True zero administration client.** The war cry of many IS and help desk managers is to eliminate client-side software installation. This appealing promise of the Internet will require 100 percent Java applets or native Java thin clients as Web browsers. Such Web-savvy solutions must support small footprints in terms of physical memory and disk space requirements—for example, 1MB unzipped for a minimal installation and automatic downloads. No installation or maintenance on the client side should be required.

■ **Uncompromising security.** Increasingly, enterprises are reticent to provide broadband access to internal data. Yet competition is forcing them to open their data sources to business partners and customers. To ensure uncompromising authorized access to data and system resources, hierarchies of access must be managed by the data manager for the underlying data store. For perfect security, data access control down to the row and

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Business Objects SA
408 953-6000
WebIntelligence is a multitier, thin client decision-support system that provides ad hoc query, reporting and analysis.

Cognos Inc.
613 738-1440
PowerPlay Server Web Edition takes a PowerPlay OLAP cube and enables users to access and analyze data over the Web.

Information Advantage Inc.
612 833-3700
An extension of the company's DecisionSuite product, **WebOLAP** extends the data warehouse to remote and casual users of the Internet, intranets and extranets.

Information Builders Inc.
212 736-4433
WebFocus is a server-based reporting and analysis system designed for the corporate Internet/intranet.

Infospace Inc.
650 685-3000
SpaceOLAP is a Java-based query and analysis tool that provides Web access to multidimensional databases.

InterNetivity Inc.
613 729-4480
dbProbe is a Java-based tool for multidimensional data analysis, OLAP and data warehouse applications.

Interweave Software Inc.
408 987-0700
Web Information System is an ad hoc query and reporting tool for Web browsers that works with one or multiple databases.

IQ Software Corp.
770 446-8880
IQ/LiveWeb provides complete Web-enabled database reporting.

MicroStrategy Inc.
703 848-8600
DSS Web is a relational OLAP interface for the Web.

Oracle Corp.
650 506-7000
Discoverer 3.0 brings dynamic ROLAP functions to users of Oracle's relational databases.

SAS Institute Inc.
919 677-8000
CFO Vision integrates financial and nonfinancial information and turns OLTP data into decision-support information.

Seagate Software Inc.
408 438-6550
Holos is an OLAP program that performs data mining from a Web browser.

Speedware Corp. Inc.
416 408-2880
Media/Web is an enterprise OLAP decision-support tool that allows Web-based data access and analysis.

SPSS Inc.
312 329-2400
NewView produces multidimensional reports. **Smart Viewer** facilitates the creation and distribution of electronic presentations.

–Compiled by Meta Group Research and edited by Carol Zarrow

column level will be regulated by a system that recognizes customer and transaction identities. Since there are so many browsers available, if an organization's Web access tool does not integrate with the underlying database's security system, then a platform-free, object-based security model to support access by selected user groups is necessary for control of entry to the database. Support for secure sockets layer (SSL) security, which authenticates database users and prevents hackers from accessing the data warehouse, is also required.

■ **Uniform meta-data.** Just as an IS department requires at best a uniform or at least a synchronized security facility, similarly a singular meta-data solution for both fat and thin client environments will be needed to minimize the administrative workload of the development organization.

■ **Support for unstructured data.** Ultimately, end users will expect the same ubiquitous access to unstructured data as they (almost) have for structured or relational data. Better support for free-form text and better overall search engine capability will provide a compelling advantage for vendors that deliver in this area.

Recommendations

The IS executives at the Social Security Administration may have had the right idea, but that's probably small consolation. Deploying off-road access to internal company data requires attention to both IT and cultural issues. Market-leading enterprises will require a mixture of fat and thin clients to untangle the world of Web access to data warehouses. The contemporary CIO should recognize that certain DSS products may support one or the other model; the savvy CIO will demand support for both.

Aaron Zornes, executive vice president and service director of application delivery strategies for Meta Group Inc. of Stamford, Conn., can be reached at aaron.zornes@metagroup.com.

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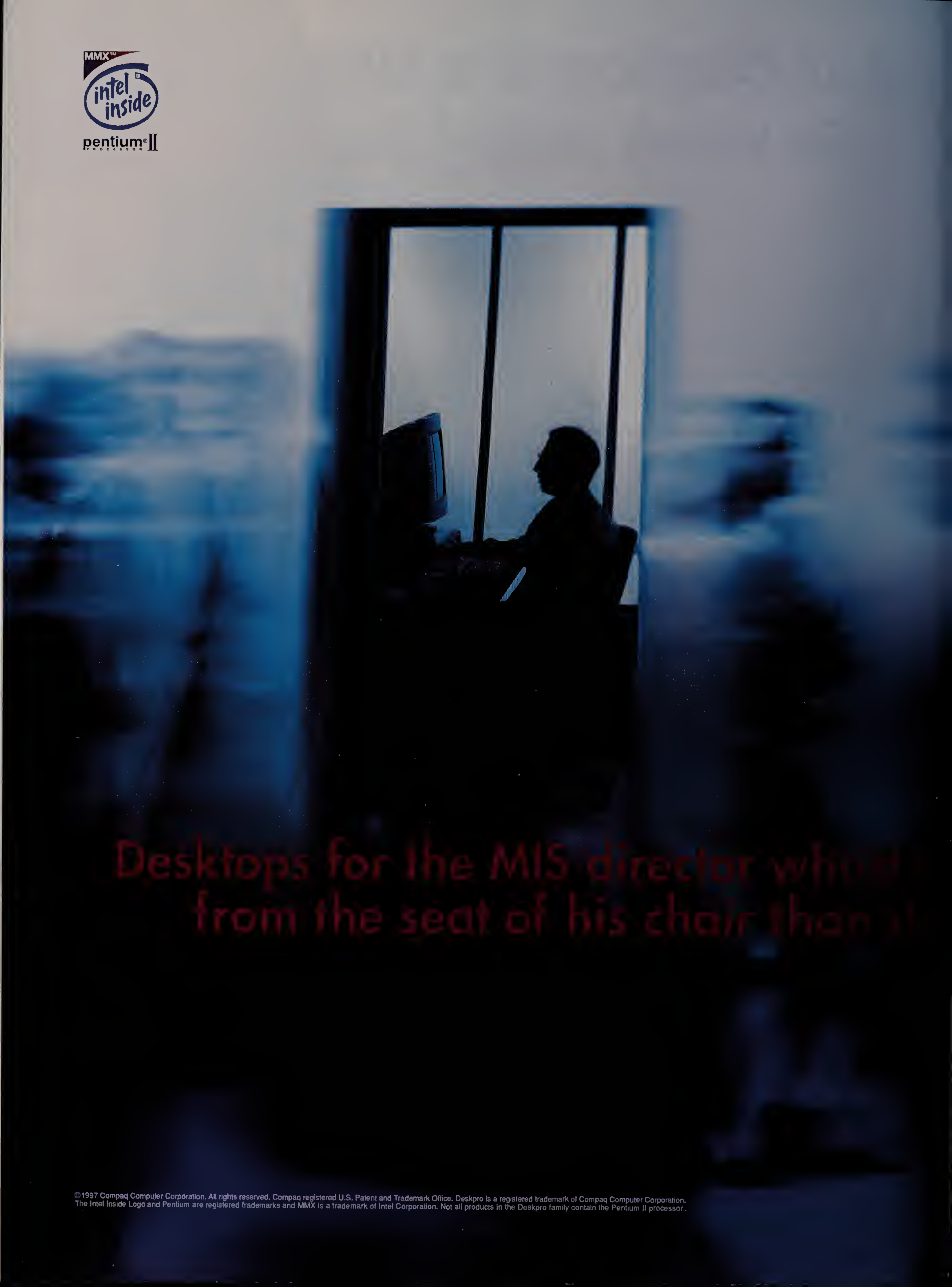
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Five Uneasy Pieces

Part 3

From time to time, we at *CIO* like to give ourselves and our readers some much-needed perspective about some much-hyped industry trends by taking a critical look at what they promise and what they deliver

Reader ROI

CO-OPETITION, ENTERPRISE RESOURCE PLANNING software, IT/business alignment, secure electronic commerce and push technology have provided fodder for many a good IT conversation and even an occasional good IT decision. In these five pieces, readers will learn to approach them with, if not outright skepticism, at least a healthy dose of common sense.

Co-opetition

The Trendline

At a management conference a few years ago, a session on negotiation strategy turned into a role-play game in which participants split up into 20 oil-producing and -exporting "countries." The ostensible task was to set a price for oil from month to month for a period of seven months in such a way as to maximize profits. Each country was paired with a competing oil-producing and -exporting country. First, one country had to decide its price without knowing the price its counterpart would set. Then variables were introduced that created either tempting or potentially calamitous opportunities. Eventually, talks were allowed between the competing countries, opening the door to something a bit like price fixing.

As the "months" clicked by, interesting dynamics developed as a result of those talks. In one case, an especially bellicose country refused to collaborate in good faith, despite pretending to do so, and deceived its counterpart at every turn. Such hostilities led, of course, to a full breakdown of trust, and the two countries produced—by a very large margin—a lower profit than any of the other pairs.

Naturally, the instructor cherished this failure as wonderfully instructive. He was a proponent of what was to become "co-opetition"—the art of lambs and lions (or, occasionally, lions and lions, or lambs and lambs) lying down together for the mutual benefit of all concerned.

Some of the countries in the exercise "co-opetated" (if that's the verb) with great insight and success, realizing that in working together they could maximize their profits. The secret lay in overcoming the competitive reflex that paints all "others" as enemies; the sooner that happened, the more money the pairs made. But it was only a game. And many of the players doubtless came away convinced that the world of commerce contains at least as many rapacious samurai as it does warm and fuzzy New Age "collaboratarians."

ILLUSTRATIONS BY SCOTT NASH

What It Promises

Ultimately, co-opetition—a coinage attributed to Novell founder Ray Noorda—draws on games theory for its fundamental principles. It raises enlightened self-interest to the level of cagey strategy, and at its best it creates a discipline for evaluating alliance opportunities at a time when many enterprises believe astute alliance-making is a core competitive competency.

There are some good and hopeful examples of productive collaboration among otherwise keen competitors. In the electric utility industry, for example, regulatory requirements led a cross-section of the industry, representing more than 70 percent of the transmission lines in the United States, to fund a system of Web sites designed to sell excess power-transmission capacity. Collectively called "Oasis," the system is expected to account for $25 billion to $50 billion of electronic commerce transactions annually (see "Wired," *WebMaster*, February 1997). Several years ago, Wall Street heavy hitters Citibank, First Boston, Goldman Sachs, Morgan Stanley, Salomon Brothers and Shearson Lehman created a groundbreaking partnership called Electronic Joint Venture Partners to provide a shared technology infrastructure for the companies' bond-trading activities. The system was to be used by all, thereby solving shared communication and transaction-processing problems that did not affect their respective competitive relationships.

The Pitfalls

Many lucrative business opportunities are so fleeting that it makes little sense for an organization to create the internal competency required to exploit an alliance; the better course might be to pursue one with another player already possessing that competency but perhaps lacking another that your company has. But Apple devotees had reason to hiss and jeer when Bill Gates's outsized image graced the satellite broadcast screen at MacWorld Expo this past summer to announce he was buying a stake in—as opposed to driving a stake into—Apple. (Would Obi-Wan cut a deal with Darth?)

- If your success requires someone else's failure, avoid co-opetition altogether (unless, like the role-playing oil country counterparts, you are focused on screwing the competition by pretending to make a deal with them). Likewise, steer clear of alliances with enterprises that believe in business as warfare.

- If your culture is built upon demonizing competitors, be prepared for some internal hissing and jeering—and perhaps the eventual scuttling of any potential benefits.
- Not all purposes are suited to co-opetistic relationships. Sometimes an internal competency needs to be built rather than borrowed or rented. Sometimes an opportunity is too central to your long-term competitive fate to be shared with other parties. Mostly, though, co-opetition is a skill to be learned and applied with both rigor and caution. Start with a decent primer: *Co-opetition: The New Win/Win Game Theory Approach to Business Strategy*, by Adam M. Brandenburger and Barry J. Nalebuff (Doubleday, 1996).

–Lew McCreary

ERP Software

The Trendline

Blame the phrase "enterprise resource planning" (ERP) software on the analysts at Gartner Group who coined it—the belching acronym is an appropriate tribute to what is an indigestible stew of jargon.

Blame the inflated expectations associated with this unfortunate phrase on the vendors that sell the software and the customers who buy it. It's not that the software itself is shoddy—on the contrary, most customers of the "big three" ERP vendors (SAP, Baan and PeopleSoft) report that they got their money's worth.

ERP software is designed to model and automate many of the basic processes of a company, from finance to the shop floor, with the goal of integrating information across the company and eliminating complex, expensive links between computer systems that were never meant to talk to each other.

What It Promises

ERP is a software mirror image of the major business processes of an organization, such as customer order fulfillment and manufacturing. Its success depends upon reach: A circumscribed ERP system isn't much better than the legacy system it replaces. In many cases,

it is worse because the old code at least was written specifically for the company and the task. ERP's set of generic "canned" processes shines only when used to connect parts of an organization. When a warehouse in Singapore enters a customer order, for example, that data flows automatically to others in the company who need to see it—to the finance department at headquarters in New York and to the manufacturing department in Europe. The lure of information integration struck a chord with CEOs and CFOs—ERP vendors' primary targets—and sales of ERP took off in the early '90s.

The Pitfalls

Unfortunately, CEOs and CFOs also saw ERP as a panacea for the random, redundant proliferation of client/server systems around the company. ERP became a sort of reengineering battering ram to sweep away all the bad, old computers in a single stroke and reorganize the company on one integrated computer system. Vendors didn't dare sell ERP this way, but they didn't dissuade customers' fantasies either.

- The dream of "one company, one system" can become a nightmare. Multimillion-dollar ERP implementations that try to make the dream a reality often stall or fail. Though the ERP vendors take the brunt of criticism for these problems, the software has little to do with them. "The slowdowns in these projects have nothing to do with the technology," says Bobby Cameron, senior analyst in the packaged applications strategies service for Forrester Research. "It is the user community's inability to absorb change."
- If expectations aren't managed properly, ERP projects can suffer. Companies and their consulting firms must set aside sufficient time to build support for the new system and the new ways of doing things before plunging into the software installation. They should keep a tighter focus on business processes than on the software installation, which is relatively straightforward.
- No single ERP package can do it all because its generic processes will only go so far. Companies will always have industry-specific or proprietary processes that are unique and cannot be handled by an ERP system. "ERP awakened the dream of viewing the whole enterprise at once and pushing a button and having the enterprise respond," says Cameron. "The software cannot live up to that dream." Still, the ever-hopeful vendors continue to add options to their ERP packages to build more market share.
- Don't expect to finish. As soon as this stuff is installed, the vendor will most likely have an upgrade ready or a new must-have set of canned processes. Case in point: There's a new acronym in town—SCM (supply chain management). These packages help forecast the best possible balance between production, inventory and sales so that customers get what they need and you're not stuck with excess inventory. ERP and SCM are coexisting uncomfortably these days and threaten to merge.

Yet another acronym is rumored to be in the works at Gartner.

–Christopher Koch

Secure Electronic Commerce

The Trendline

As the newest forum for both business-to-business transactions and good old-fashioned shopping, electronic commerce has the potential to be a big money-maker. But because the same consumers who cheerfully hand over their gold cards to salesclerks and waiters often harbor suspicions about what will happen to their credit information when they send it out into the ether, companies must be able to assure their customers that no harm will come to them if they choose the electronic route to making purchases.

"You probably take more chances when you hand out your credit card in a store or restaurant," says Bill Hancock, a security and networking expert and executive vice president and chief technology officer at New York City-based Network-1 Software and

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Technology Inc. "When done correctly, electronic commerce can be perfectly safe."

To convince consumers, companies can use technologies that meet the secure electronic transaction (SET) standard set in May by a consortium of credit card companies and software vendors. The SET Mark, which is like a Good Housekeeping Seal of approval for electronic commerce software, should be showing up on qualifying Web sites by the end of this year. The label assures users that software on the site meets SET specifications and is therefore safe for online transactions. With the SET protocol, the vendor does not directly receive a credit card number. By using encryption algorithms and specifications for online use of credit cards, the credit information is fed directly to the bank.

To complicate the issue, opening the doors of a network to customer transactions makes the enterprise vulnerable to attack as well, so CIOs face the unenviable task of placating both internal and external customers.

What It Promises

This year, electronic commerce accounted for $7 billion in business-to-business sales alone, according to Melissa Bane, a senior analyst at The Yankee Group in Boston, and that number is expected to rise to $171 billion by the year 2000. On the business-to-consumer side, Yankee Group reports sales of $2.74 billion this year and predicts that by the year 2000 the number will increase to about $10 billion. To make sure those numbers rise as predicted—and to make sure they get their share of the money—companies need to soothe jittery consumers by installing some basic security precautions such as firewalls and secure servers and software.

The Pitfalls

For every industry expert who says electronic commerce is reasonably safe, there is a potential customer who is nonetheless reluctant to take the e-commerce plunge. Improved security products such as new AS/400 servers from IBM, introduced in August, promise beefed-up Internet security. Those products, in addition to recognition of the SET standards, may go a long way toward alleviating consumer fears. But until then, it's up to the companies that hope to profit from the Web to convince potential customers of their reliability.

- Evidence of Web fraud collected by watchdog organizations can increase potential customers' fears. Webguardian, for example, a nonprofit group founded by Terrence Gardiner, a Silicon Valley mechanical engineer, functions as a sort of Better Business Bureau in cyberspace. Since the group launched a Web site in March, Gardiner says, he's been swamped with queries and complaints about consumer fraud via the Internet.
- The SET stamp of approval does not guarantee that companies engaged in electronic commerce are employing safe methods such as firewalls to frustrate hackers. Web site managers must continue to use encryption and authentication components to keep their sites safe.
- Hidden files and cookies—those small bits of information, such as passwords, that a Web server sends to a cookie-compliant browser—can cause glitches in network security. Web managers need to program around this so that users can't manipulate cookies to get at billing information and other private data.
- CIOs preoccupied by electronic commerce security may give short shrift to internal security. As it happens, most security lapses can be traced to insider hacking that leads to unauthorized access to computer files, unlawful copying of copyrighted or licensed software and telecommunications fraud. In fact, the FBI reports that inside jobs account for as much as 85 percent of network security breaches.

–Mindy Blodgett

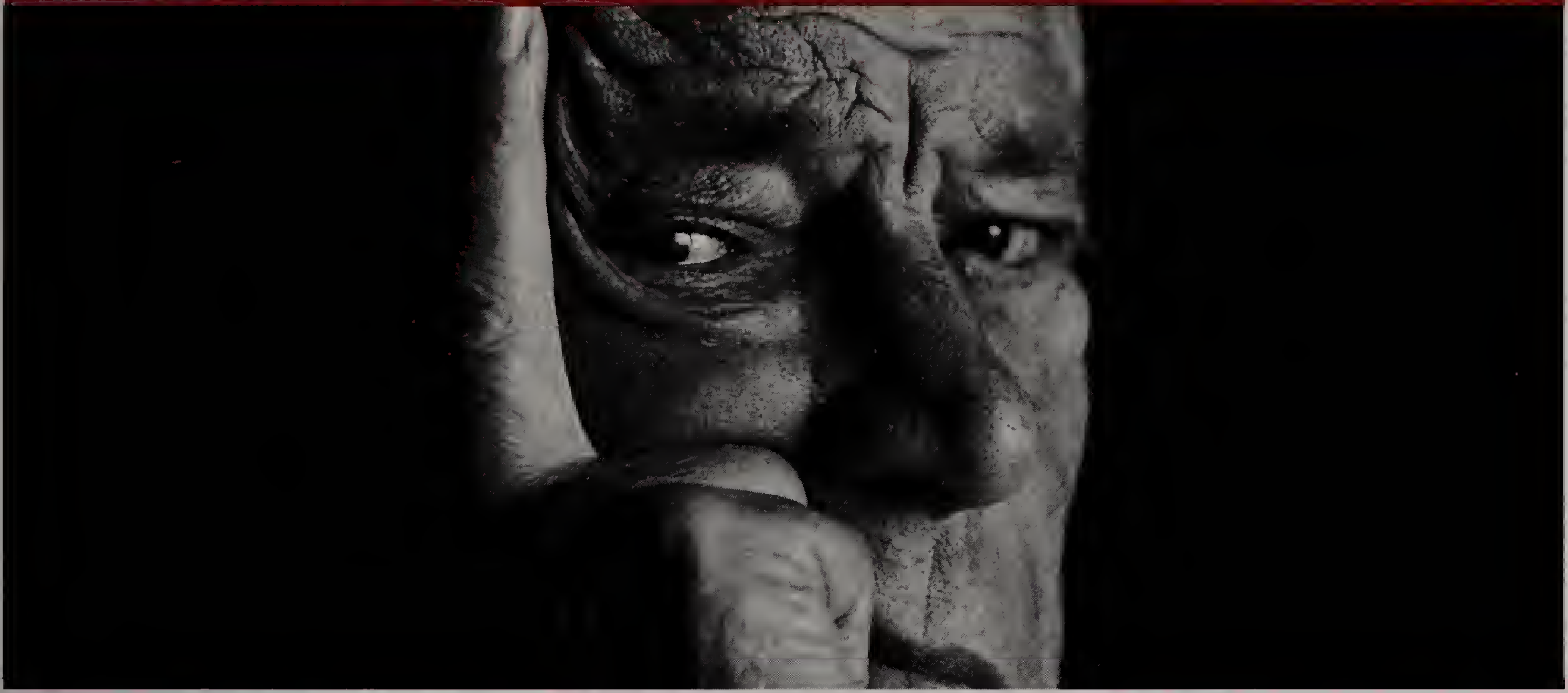
IT/Business Alignment

The Trendline

If there's a Holy Grail in information systems, then IT/business alignment is it. IS executives have always strived to make IT strategies march in step with their organizations' greater business objectives in their quest for perfect IT/business alignment, wherein CIOs have a seat at the "big table," IS professionals work alongside their business-side peers and every IT project not only supports but enables business strategies.

When organizations find the Grail, the rewards are great. Witness 1997 CIO-100 award recipient Chase Manhattan, whose IT and business personnel work together at all levels of the organization to achieve competitive advantage. Then there's Charles Schwab,

“Great. Our whole network crashes, and then I find out it could have been avoided two weeks ago.”



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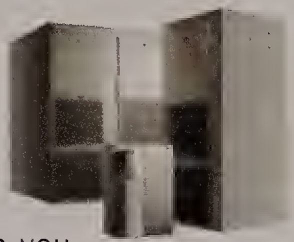

To learn more about how NCR can help you set up a scalable data warehouse that's perfect for your business needs, call 1 800 CALL-NCR, ext. 3000. Or visit us on the web at www.ncr.com. To learn more about Hallmark, visit www.hallmark.com.

NCR

Transactions in the Age of the Consumer

another CIO-100 honoree. Just three years ago at Schwab, the Internet was an untapped medium. Now an IT/business partnership has resulted in several new products that have helped Schwab carve out a market share that's nearly half of the estimated $111 billion online brokerage industry.

Yet alignment wouldn't be considered a Grail were it easy to attain. The road to IT/business alignment is strewn with ex-CIOs who tried and failed. Their downfall? Alignment is easy to want—indeed, Computer Sciences Corp.'s (CSC) annual study, "Critical Issues of Information Systems Management," has reported for three straight years that the top issue among senior IS executives is aligning IS with corporate goals—but it proves infernally difficult for organizations to define and therefore to achieve.

What It Promises

In *The Squandered Computer* (The Information Economics Press, 1997), IT guru Paul A. Strassmann defines IT/business alignment as "the capacity to demonstrate a positive relationship between information technologies and accepted measures of performance." In other words, if your business measures success in terms of profits and margins, then your IT projects must demonstrate a direct, positive effect on those metrics. Furthermore, says Chuck Weiss, a senior partner with CSC, an aligned IS department can help business partners achieve better results from a consistent IT investment—or get the same results from a reduced investment—and understand clearly the limits and capabilities of IT within the organization.

But the relationship is reciprocal. Beyond what it can do for the business's bottom line, alignment can pay off handsomely for the IT professional. Ideally, when the CIO is a part of the senior management team and eschews techspeak, it becomes easier for business executives to value technology and for IT to become a key ingredient in all-important strategy decisions.

And when IT professionals work day to day with their business-side counterparts, personal and professional relationships form, and alignment becomes a practice that bubbles up through the organization rather than a concept that's handed down to employees from their bosses.

The Pitfalls

In an era in which CIOs increasingly turn to packaged solutions, alignment stands out as a classic example of an in-house project. You can't buy alignment like you can SAP or a sales-force automation application; alignment must be built within the organization by multiple partners and must be judged by specific business metrics. The goals of alignment are universal, but to reach those goals CIOs need a unique strategy that reflects and meets particular business needs. Some other fundamental cautions:

- CIOs cannot create alignment alone. Business executives need to articulate alignment goals and define the metrics by which the success of alignment will be measured. "The moment the CIO goes into [trying to define] the metrics business, he's going to get chopped off at the legs," warns Strassmann.
- Alignment can reveal dark secrets. In other words, Weiss says, "if your IT organization has been spending IT dollars in the wrong location, alignment can reveal that the IT organization has been poorly managed." Not exactly what you want your boss to see.
- It's possible to be too aligned, or too tied in to a single business strategy. If an IS group expends vast intellectual, financial and technical resources on a single business strategy and then the strategy changes, all the earlier effort is for naught and alignment loses its value. "I see that all the time," says Strassmann. "Clearly, the smart CIO should understand that business is intrinsically unstable—they need a contingency plan."
- Finally, alignment is a squishy concept to grasp and measure, which sometimes makes for a tough sell both to IS professionals and business executives who are used to dealing with tangible facts and figures. "I've never heard [a CIO] say, 'Now we are finally aligned,' or 'We're 10 percent more aligned than we were last year,'" says Tom Davenport, a regular *CIO* columnist and director of the Information Management Program at the University of Texas at Austin who has seen attempts at alignment both succeed and fail. "[Alignment] is an important idea but difficult to make work in practice."

–Tom Field

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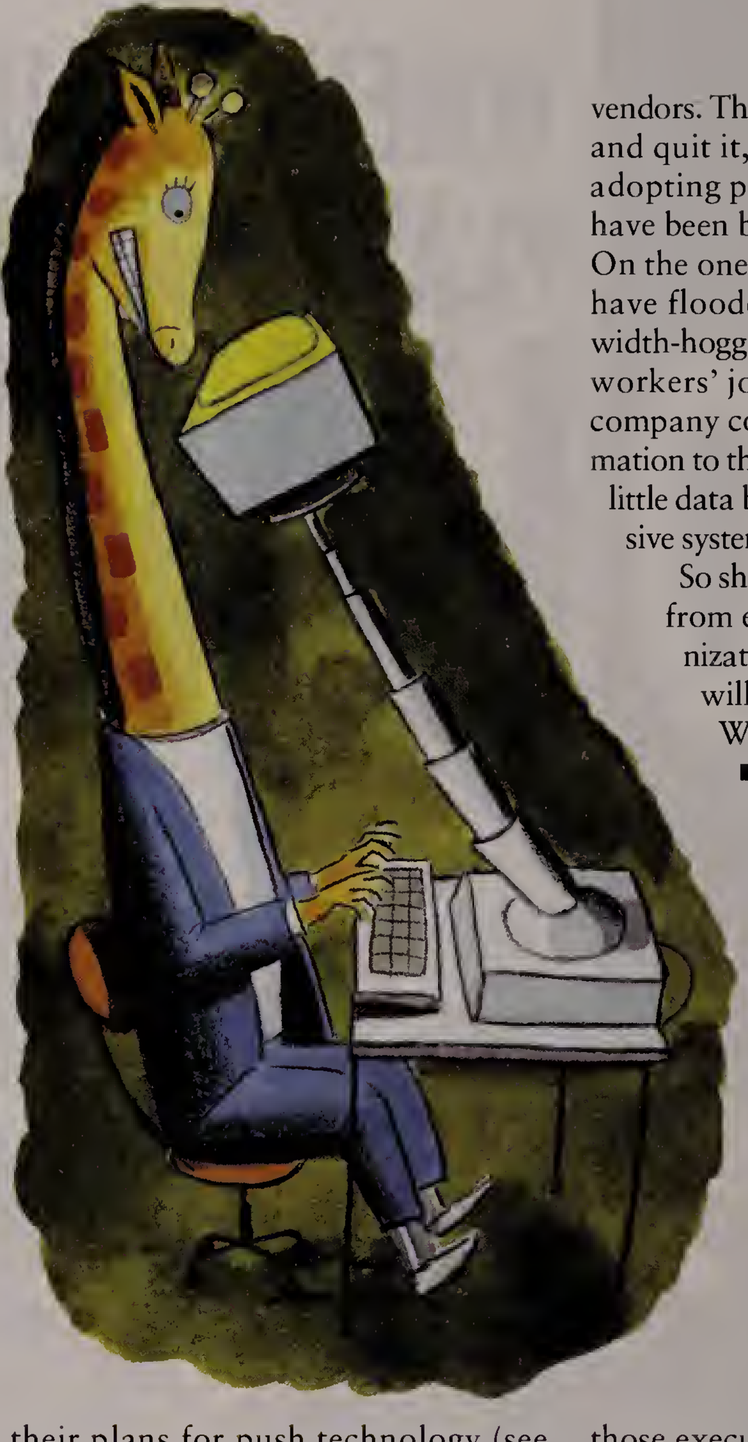
REALITY CHECK

Push Technology



The Trendline

Here's a new method of data delivery to warm the heart of every marketeer and office micro-manager. No matter what time-wasters occupy an employee—quarterly reports, personnel reviews, annual projections—now they can be interrupted by matters of genuine urgency, like real-time updates of NCAA March Madness basketball scores. Push technology seems designed to turn $2,000 desktop computers into $300 Sony TVs.

"Data glut" and the nature of the Internet made a technology like push (or, as it is sometimes called, "webcasting") inevitable. The "pull" model of information retrieval from the Internet requires critical thought, not to mention an understanding of Boolean logic, those delimiters common to search engines such as AltaVista. But a push model filters content from multiple sources according to user preferences and transmits it to the desktop in a neat package. It's the difference between finding a book at your own pace in a library and having a television station program director decide what you need to know and when.

A few strategies have emerged for using push technologies. In one model, an individual user subscribes to outside information sources, and a service provider such as PointCast will gather and transmit information to fulfill that user's expressed needs—along with a lot of advertisements. In another model, an enterprise generates its own content. Managers send news to workers who need updates on sales strategies or repair manuals or whatever management believes is urgent. Typically, that kind of setup limits or eliminates all ads as well as controls how much time workers can devote to perusing recreational channels.

What It Promises

Push seems like such a no-brainer that as soon as it arrived on the scene about a year ago, startup companies such as BackWeb Technologies, Marimba and the now-bankrupt Ifusion promoted it as the ideal model for electronic commerce, or for human resources management, or to meet your true love, raise your children, create great art and make a buck on the side. In these pages, information executives were surveyed about their plans for push technology (see "Pushing It," *CIO*, May 1, 1997). After all, a conscientious manager who ignores the parade at his back risks being trampled face down into the dust.

The Pitfalls

Company after company first encouraged its employees to download free push technology software, says John C. McCarthy, group director for new media research at Forrester Research. But within days of doing so, he adds, networks and hard drives were collapsing under the overload of data that was pumped indiscriminately to them. The loss in productivity was huge.

Some executives found the business case for push technology to be equally treacherous. Mitch Hadley, vice president of the strategic technology group of NationsBank in Charlotte, N.C., had opted for a pilot push technology system that gave him more control over content than he'd have with most Webcasting vendors. The result? "We closed the pilot and quit it," Hadley reports. He says adopting push technology would not have been beneficial for NationsBank. On the one hand, NationsBank could have flooded its network with bandwidth-hogging multimedia irrelevant to workers' jobs; on the other hand, the company could have limited the information to the strictly relevant and had so little data being pushed that the expensive system remained largely dormant.

So should you be erasing browsers from every desktop in your organization because push technology will obviate any need for them? Well, hold off on that.

- That sucking sound so many information executives heard coming from the network was push technology ravenously devouring bandwidth. Unrestrained admission of data from a "free" push technology service is likely to include lots of advertising whose sound, images and text will bog down your network.
- Push technology delivered over your LAN firewall may contain lots of ActiveX or Java applets, those executable files that can carry a computer virus.
- People don't always favor intrusive technologies—that's why telephone answering machines were invented.
- Any filtering system designed to relieve you and your employees from information glut can be so exclusive that moving to the system is not worth the time and energy or so inclusive that the system filters nothing at all.
- Finally, consider whether there is any information, short of a fire alarm, so hot for enterprisewide distribution that it needs to go out immediately. When managers create an environment where a constant flow of information must be immediately consumed, workers are likely to get a bad case of indigestion.

–Perry Glasser

To revisit what made us uneasy in the past, see Part 1 of "Five Uneasy Pieces" in CIO, *Dec. 15, 1993/Jan. 1, 1994, and Part 2 in June 1, 1996.*

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WHAT'S THE DIFFERENCE BETWEEN A LITTLE KID WITH A WEB SITE AND A MAJOR CORPORATION WITH ONE? NOTHING. THAT'S THE PROBLEM.

Building a publishing-only Web site is the first step to becoming an e-business. A step that most businesses (and a lot of little kids) have already taken. That's fine as far as it goes – it's a very cost-efficient way to distribute basic information.

But the real payoff (for businesses, at least) comes with steps two and three. Step two is moving to "self-service" Web sites – where customers can do things like check the status of an account or trace a package online.

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IBM has already helped thousands of companies use the Web to make the leap from being a business with a Web site to being an e-business – putting their core processes online to improve service, cut costs or to actually sell things.

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e-business economics are compelling. According to a recent Booz-Allen & Hamilton study, a traditional bank transaction costs $1.07; the same transaction over the Web costs about 1¢. A traditional airline ticket costs $8 to process; an e-ticket costs just $1. Customers love the convenience; management loves the lower costs.

IBM solutions have already helped thousands of businesses become e-businesses. To find out how IBM can help you do the same, bookmark www.ibm.com/e-business or call us today at 1 800 IBM 7080, extension NC32.

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Without flexible control over who sees what information, all the benefits of putting your key business processes online (which is, after all, the definition of an e-business) are a moot point. And when you connect your critical systems to the Web to help you improve customer service or increase the efficiency of your organization – security is a white-knuckle issue for the people charged with keeping your systems running and your data protected.

It's not just a matter of whom you let in and whom you keep out (although that is obviously important). When you're using the Web (or an intranet) to do things like let your employees change the asset allocation of their 401(k) accounts or let your customers see what their credit balance is, you need the ability to determine who sees what and who can make changes to what they see.

IBM e-business solutions can help you manage access to the really important information you make available online. We've spent over three decades protecting the integrity of corporate information systems. We've pioneered things like Realtime Intrusion Detection, Anti Virus Labs, and Emergency Response Services. And we've made security an integral part of IBM e-business technology – so you can build Web sites that know how to keep a secret.

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WI

Policing employees' Web access may be distasteful, but if you haven't looked to see whether workers are frittering away productive time or misusing company assets, laying down the law may be a practice that will pay dividends

BY TOM FIELD

EB COPS

Darren Constance is a self-described computer geek who has seen the worst of the World Wide Web. Hate, violence, crime, frivolous entertainment and raunchy sex—those are the waves Constance surfed. At his last job, eight hours a day, five days a week, he cruised through 120 low rent sites; on a good day, he hit 200 (the record is 600). "I went through the Web and looked for everything you're not supposed to," Constance says, adding with a hint of a smile, "I learned something new every day."

Hacker? Slacker? Wayward surfer wasting the boss's time and dime? No, before his recent promotion, Constance was one of four professional Web surfers employed by San Diego-based NetPartners Internet Solutions Inc., manufacturer of WebSense, a server-based Internet filtering system. Ten employees now perform that function. The sites they discover each day are fed into WebSense's 100,000-URL database each night and then transmitted to scores of corporate customers who try to keep their internal networks safe from their own hackers, slackers and wayward surfers.

Reader ROI

SOME COMPANIES MONITOR OR BLOCK Internet use. Should yours do the same? Learn how Web monitoring can help your company

- Increase productivity
- Avoid liability
- Protect corporate assets

PHOTO BY WEBB CHAPPELL

Surf Patrol

AS THE INTERNET BECOMES a ubiquitous business tool, employers are ever more mindful of where their employees might be surfing. Some of them are going so far as to monitor, if not bar, access to sites deemed inappropriate during working hours. Part of the "Web cops" concern can be chalked up to fear. There are a lot of time-wasting Web sites out there, ranging from the benign (ESPN SportsZone) to the boudoir (Penthouse et al), and managers worry about the effect of these distractions on the workplace. Then there are less innocuous concerns: lost productivity, clogged networks, the security issues of private information sneaking out through the firewall or potentially actionable material sneaking in.

Fueling Web cops' fears are bits of anecdotal evidence that seem to border on the apocryphal. A 1996 Nielsen Media Research survey showed that the online edition of Penthouse magazine was being called up thousands of times a month by employees at such industrial giants as IBM, AT&T and Hewlett-Packard; also last year, Compaq Computer dismissed approximately 20 employees who had logged more than 1,000 hits on sexually explicit Web sites.

Why does the typical business opt to monitor or restrict employee Internet use? What challenges must be overcome?

Dawn LePore *serves and protects valuable bandwidth from frivolous uses.*

Of the 40,000 Web sites visited by employees on **one** day, fully **13 percent** were **considered** by management to be **inappropriate.**

What results do these businesses see once they've undertaken these efforts? Industry analysts and think tanks have yet to put these questions to rest, but "Maximizing the Internet: Policies, Procedures & Best Practices," a report prepared by CIO Communications Inc. (publisher of *CIO*) and consultancy ICEX Inc., provides some answers.

The report, based on the survey responses of 125 professionals from a variety of small to large industries, indicates that nearly half of the respondents don't have a formal Internet use policy in place at their companies—a prerequisite for effective Web monitoring or blocking. Results were split almost evenly over whether companies monitor employee Internet use. Of those that do monitor, 40 percent actually restrict access to some Web sites. In both cases, large companies—those with the most users—tend to be the most restrictive (see "Internet Surveillance," Page 57).

Not many companies admit to playing Web cop, but that doesn't mean they aren't or won't begin to, says Bruce Guptill, research director in electronic commerce and the Internet for Stamford, Conn.-based Gartner Group Inc. "When we talk to clients, they're all talking about wanting to and needing to

Civil Insurrection

One CIO **fought** the **Department** of **Energy's** Internet use policy—and **won**

When David M. Cooper first joined Lawrence Livermore National Laboratory in Livermore, Calif., as associate director for computation in 1995, he was dumbstruck by what he considered the lab's overly restrictive Internet policy. Handed down by the lab's parent agency, the Department of Energy, the policy stated in no uncertain terms, "no personal incidental use." Period.

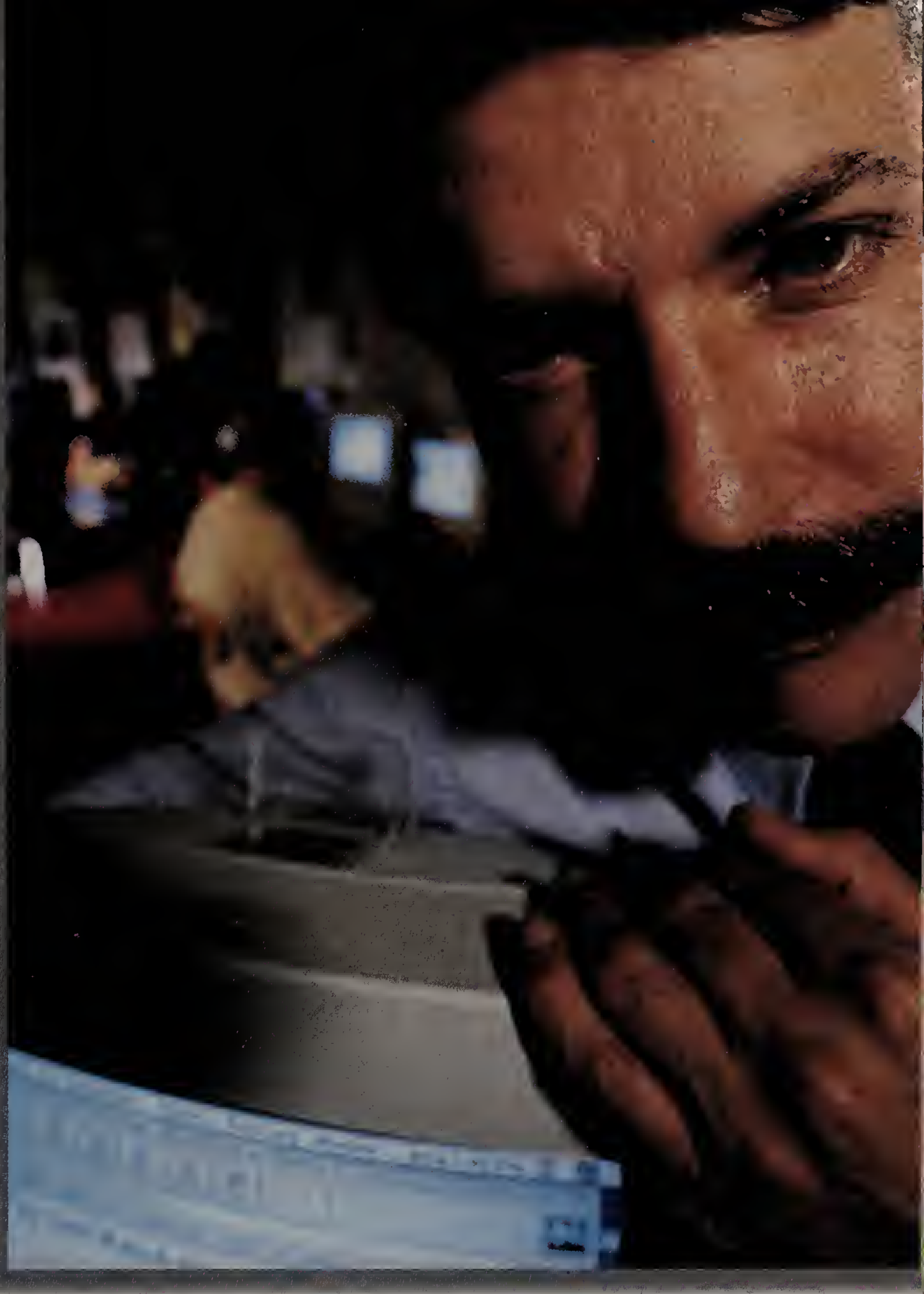
"I was told by the people in the DOE that if I received an e-mail from someone asking me to go to lunch, I could not respond," Cooper says. "I could pick up the telephone and take the time to call that person, but I could not respond by e-mail."

Cooper sought relief. In February 1997, he approached the DOE with a new, less restrictive policy and an argument that a little incidental use [monitor or restrict Web use], but we've received little feedback from anyone who's actually doing it," Guptill says. "Out of 30,000 clients worldwide, I can think of only two who are actively monitoring and filtering their employee Web use."

In his experience, Guptill says, client interest in monitoring employee use of the Web hit its peak a year ago. Since then, it has tapered off, as managers have become comfortable with the Internet as a business tool and employees have become less enamored of the new toy—and more familiar with their companies' Internet use policies. "Does this mean there isn't a problem [with unrestricted employee Internet use]? I don't think so," Guptill adds. "Does this mean people still don't know how to deal with it? I think that's so."

Crowd Control

IN FACT, SOME COMPANIES are flat-out changing their approaches. Count Charles Schwab & Co. Inc. among the new converts to Web monitoring. Two years ago, when the San Francisco-based financial services company started to make money via the Internet with its e.Schwab service, senior managers rolled out the Internet to Schwab employees and for the pilots program took a "let's all be adults here" attitude, choosing not to impose restrictions. But that approach evolved, says Executive Vice President and CIO Dawn G. Lepore, after managers noticed a significant percent of network traffic was for nonbusiness surfing. "We still believe we should treat our employees like adults, but given the potential bandwidth risks and the [growing] number of people across the company who have Web access, we felt we needed some additional structure." As part of this approach, Schwab has implemented an Electronic Communications Usage Security Policy, which specifies Schwab's primarily-for-business-uses expectations regarding Web browsing and e-mail. Schwab also recently implemented SmartFilter for Netscape Proxy Sever software, developed by Secure Computing Corp. of Naples, Fla. SmartFilter can enable a company not only to monitor the volume of network traffic but also to identify the internal IP address from which specific traffic originates, the URLs accessed from that address and the approximate amount of time spent browsing. This function allows network managers to identify potential abusers of the system, notify them and, if necessary, alert their managers. As soon as employees heard of the new measures, Schwab achieved its desired result. "We currently block only one category (sex). The Netscape proxy server provides a log of all accesses to the Internet, and we have generated manually lists of individual IP address use patterns to help with various investigations," says Lepore. "Using this SmartFilter feature has yielded a substantial decrease in the volume of nonbusiness-related Web browsing on the system."



Brad Johnson *shields students at his school in Tacoma, Wash., from inappropriate Web sites.*

Schwab's policy is typical of companies that monitor or restrict employee Internet use. The most common customer issues are that management wants a simple "phone bill" to document where and how long employees are surfing or wants information about Web abuse, which is wasted time, and inappropriate material downloaded, says Patrick Fischer, SmartFilter product manager in Secure Computing's Web tools division. No single type of business favors Web controls, Fischer says—"we get them all"—and size doesn't matter, although a company generally requires at least 50 users before business managers feel they have a situation that requires electronic surveillance.

As for what the companies tend to monitor or block, no

LEFT PHOTO BY KENT HANSON; RIGHT PHOTO BY DAVIS FREEMAN

might go a long way toward improving people's Internet skills. "Say my secretary wants to grow roses," Cooper argued. "During her lunch hour, she goes on the Internet and looks for Web sites to give her information on growing roses. By doing that, she becomes proficient with the Web. I'm convinced that is training for the Web. Now when I need her to find some [business-related] information for me, she'll at least know where to begin to look."

The DOE was swayed. Starting in June, LLNL enacted an alternate Internet use policy that allows lab employees to send and receive personal e-mail and opens Internet access to "that which is work-related and incidental use for educational and personal development reasons is permitted."

Cooper says, "This just legitimizes what a large number of people already did. Probably there are a few more people spending more time on the Web, but I'm glad they are."

And when Cooper returned to LLNL and reported the news about the new, looser policy? "I actually got applause twice," he says. "I hadn't had that happen once since I got here." *–T. Field*

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surprises here. Reminiscent of comedian George Carlin's famous monologue, "Seven Words You Can Never Say on Television" the five categories of Web sites most frequently banned by businesses are sex, gambling, hate speech, criminal skills and drugs. Sports, leisure and investing fall into a "softer" category of sites that tend to be banned only during working hours, unless of course the business happens to be sports, leisure or investing.

When Perception Is Reality

STILL, COMPANIES DON'T always adopt Web-filtering devices in response to a specific problem or to ban a particular activity. Sometimes the impetus is simply to correct a matter of perception. This was the case with the Franklin Pierce School District in Tacoma, Wash. When the district announced about three years ago that it planned to offer Internet access to students and staff, there was an immediate public outcry—parents complained, the newspaper editorialized and even the school board got involved. To quell the uprising before he plugged in his first browser, Brad Johnson, the district's network systems coordinator, secured a Web-filtering device: the SurfWatch software system, from Spyglass Inc. Installed on proxy servers located at the district's individual schools, the system provides a filter to block sites the school district deems inappropriate. The SurfWatch system regularly updates a list of 50,000 sites (the product's corporate version contains about 100,000 sites) containing offensive material, and educators can suggest further restrictions they would like added to the filter. "It saved me," Johnson says of SurfWatch. The public and the school board were so impressed with the preemptive measure that they gave their blessing to in-school Internet service and, so far, Johnson says, the system has worked flawlessly.

Attorney **Marcelo Halpern** *advocates caution in making laws where there are few precedents.*

Perception was also a concern when Asics Tiger Corp., the Fountain Valley, Calif., sportswear manufacturer, last year introduced Internet and e-mail access as electronic commerce tools to about half of its 200 employees. "The CEO's first reaction was, 'We don't want to give Internet access to anybody,'" says Mark Allen, MIS operations manager, who championed the Internet rollout. The CEO's concerns were the usual—productivity and liability—and Allen countered with a convincing business case that Asics Tiger employees needed the Internet to communicate with customers, to track UPS shipments, and to monitor complementary sports and business sites. But what won over the CEO was that Allen secured the services of Net Partners and its WebSense server. With WebSense's ability to block all adult Web sites by URL and to allow MIS managers to track users' Internet habits, the CEO was sold. Internet service was rolled out.

Employee resistance is always a concern when **managers** implement a **dramatic** new **policy.**

The Law

PEOPLE ASSUME THERE ARE a lot of legal issues surrounding Web monitoring and blocking, but none of these ill-defined "issues" really has been tested in court, says Marcelo Halpern, attorney with the Chicago-based IT specialty law firm Gordon & Glickson PC. Yet, there are concerns an executive must address.

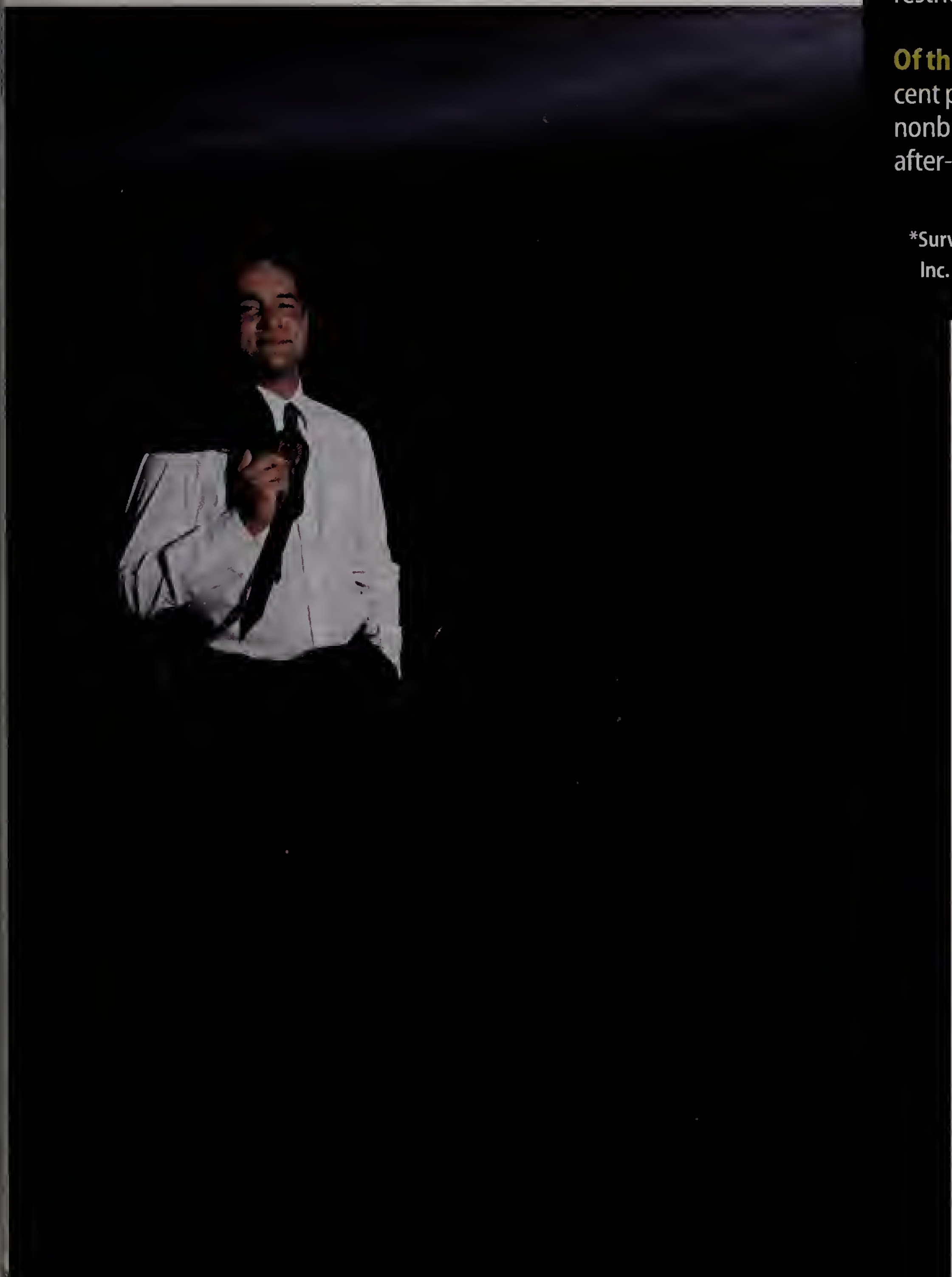
Whether businesses legally can monitor Web use (and e-mail, for that matter, which often is a related concern) was decided by the federal Electronic Communications Privacy Act (ECPA). The act assures employers the right to keep tabs on what is done with employer-owned property, such as computers and telephones. Yet, even with this legal precedent, Halpern advises companies to declare their monitoring intentions upfront. "You don't want people to have an expectation of privacy," Halpern says. He also urges companies to enforce Internet restrictions evenly, and he's wary of companies that try to use Draconian Internet policies as an excuse to fire employees. One national company, for example, established a "no personal incidental use" policy and in the first year under the restriction, 15 people were fired for violating that rule. "I haven't seen those policies challenged legally, but I think they're open to be challenged," Halpern says.

While termination is a threat, companies commonly take a lighter-handed approach—especially for first-time offenders. In the Franklin Pierce School District, for example, students—or staff—who are caught attempting to gain access to forbidden sites can have their Internet access restricted or taken away altogether. Repeat violators can be suspended from school—and that has happened, Johnson says. For most users, though, just knowing they're being monitored is enough of a deterrent.

The same is true at Asics Tiger, where employees can be punished at the discretion of their managers if they are caught in flagrant violation of the company's policy—which really isn't all that stringent. "We have a similar approach to the Internet as we do to the phone system," Allen says. "We don't limit outside calls, but if we see something that might be considered excessive, we turn over that information to the department manager." And, so far, the soft approach has worked. "We really haven't had any issue where Internet use has been abused," Allen says.

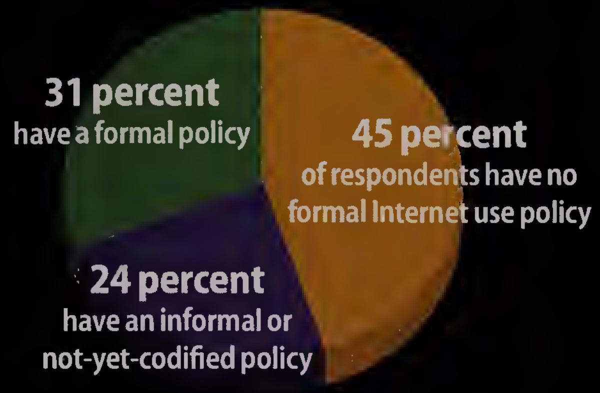
Employee resistance is always a concern when managers implement a dramatic new policy, but Halpern says it can be avoided if companies explain and implement their Internet policies clearly and fairly. Employees might not like the policies, he says, but they know they have to live with them.

The beat **Mark Allen** *walks opened the Web to employees at Asics Tiger Corp. for greater productivity.*



Internet Surveillance

125 professionals from a variety of industries were surveyed about Web policies*



Of those companies that do have formal Internet use policies, 94 percent say the reason is to ensure employee productivity. Less than 10 percent of them were driven by concerns for legal liability or corporate security.

Respondents split almost evenly over whether they monitor employee Internet use (48 percent don't, whereas 52 percent do). Of those who do monitor, 40 percent actually restrict access to some Web sites.

Of those companies that monitor Internet use, 36 percent prohibit all nonbusiness use; 41 percent allow limited nonbusiness use, but most restrict nonbusiness use to after-hours only.

*Survey, "Maximizing the Internet," available from CIO Communications Inc. by contacting Denise Perreault at 508 935-4443 or *denisep@cio.com*

"Bottom line? If [the Internet is] the employer's system provided for employee use, then it's supposed to be a productivity tool to be used for work," Halpern says. "The goal is to maintain appropriate use of the work facilities and to educate people about the risks," Halpern says. "The Internet's new, it's different, it's still a novelty to some people. But when push comes to shove, the [legal] issues are still the same as before; they just have a new outlet. [The Internet] is a new way for a lot more people to get into a lot more trouble."

Returns

A BIG COMPUTER COMPANY that didn't monitor employee Web use recently ran a one-day Internet use audit. Network traffic had seemed high, and the company was considering an expensive plan to increase its bandwidth. That is, until the audit showed that of the 40,000 Web sites visited by employees that day, fully 13 percent were considered by management to be inappropriate for business purposes. Ultimately, the company realized it didn't have an asset problem of insufficient bandwidth. It could solve its problem

TOP PHOTO BY GREG GILLIS; BOTTOM PHOTO BY KENT HANSON

The five categories of Web sites most frequently **banned** by businesses are **sex, gambling, hate** speech, **criminal** skills and **drugs.**

by curtailing surfing. The company now actively monitors and restricts employee Web access.

For some businesses, the ROI of Web monitoring stems not from correcting bad behavior but ensuring good. That is the case at Kinko's Inc., the Ventura, Calif.-based business services provider, which began offering restricted Internet access to its customers nationwide in August. Executives at the 850-store chain long had wanted to offer Internet service to customers but hesitated because of concerns about...well, Kinko's was worried about kinky Web content. "We needed to provide a comfortable environment for our customers," says Technical Development Manager Brian Gerk. "And we needed to account for the fact that [Internet material] that is considered objectionable in, say, Seattle may be different from what is considered objectionable in Atlanta." Ultimately, Kinko's went with a SurfWatch solution similar to that used by the Franklin Pierce School District—a filtering system (in a client-based version) that blocks access to objectionable Web sites. "We did not want to present Kinko's as a moral barometer of the U.S.," Gerk says, "but [SurfWatch] seems to have a pretty good feel for what middle America feels is appropriate and what is objectionable."

Brian Gerk *enforces a comfortable cyber-environment for customers of Kinko's Inc.*

PHOTO BY KENT HANSON

Future Cop

IN AUGUST, THE NATIONAL COMPUTER Security Association (NCSA), based in Carlisle, Pa., announced a new program to test and certify Internet filtering and monitoring products for corporate and consumer use. Additionally, vendors of such products have banded together under the sponsorship of the NCSA to form the Secure Internet Filtering Technology (SIFT) Consortium, with goals to promote the industry and to address common concerns of the vendor and user communities. Together, the NCSA and SIFT hope to establish and certify industry standards for appropriate filtering and monitoring capabilities across all industries.

And as the Web monitoring/filtering industry comes of age, it is likely that more businesses will come at least to explore, if not employ, the technology. Even Gartner Group's Guptill, who hasn't seen a lot of monitoring or filtering in action, concedes that clients are asking serious questions. "They ask, 'Should we be concerned about our employees on the Web?' And the answer is, Yes," Guptill says. "It's a question of employee time and resources, and it is a security risk." Guptill concedes, "A little paranoia never hurt when it came to network resources." CIO

Senior Writer Tom Field can be reached at tfield@cio.com.

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GROUP EFFORTS

In the ever-changing world of IT, CIOs find a roundtable of their peers is the best place to get both information and advice

BY MINDY BLODGETT

JED WILLIAMS, VICE PRESIDENT OF INFORMATION SERVICES at The Clorox Co. in Oakland, Calif., says his first meeting with the Bay Area CIO Round Table served as a wake-up call.

It was November 1994, and the topic that morning was the impending year 2000 crisis. "I had been thinking about the issue, but until that meeting, I didn't feel the urgency," Williams recalls. "After that meeting, where members shared how they were coping, I went right back to the office and got a project going. Now this was 1994, when most companies weren't even thinking about the year 2000 and what it means to IT. But we started talking about it, and several members were further into it than others. And that got me thinking. I would credit the fact that we are now well along in our year 2000 plans to that meeting."

Reader ROI

CIOS CAN BENEFIT FROM "ROUNDtables," groups formed to allow regular conversations with peers about sharing best practices and the word on the latest technology. In this article, readers will learn

- What makes a good roundtable
- What causes a roundtable to fail
- What roundtable membership can offer a CIO

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> **"When you think of what has happened to CIOs' jobs—a whole new generation of technologies, the Internet, intranets—joining roundtables is a necessity."**
>
> *–Jim Ware*

The Bay Area CIO Round Table is a group of CIOs and information managers from 15 San Francisco-area organizations. Members come from midsize and large companies, including Southwestern Bell, Bank of America Inc., Gap Inc. and Kaiser Permanente as well as government agencies such as the Bay Area Rapid Transit District. The San Francisco offices of Interim Technology, a consultancy based in Oak Brook, Ill., sponsors and facilitates the group with input from The Fisher Center for Management and Information Technology of the University of California at Berkeley. Members have been meeting every month for the past five years to share problems and solutions relating to the latest IT challenges.

The roundtable represents a growing trend of CIOs who form discussion groups as a way to keep up with the increasingly complex business of managing IT. Around the country, information managers are joining regular roundtables sponsored by vendors, universities or consultants—or formed on a more informal basis—to network, share best practices and learn from each other.

"When you think of what has happened to CIOs' jobs in the past two or three years—a whole new generation of technologies, the Internet, intranets—then joining roundtables is almost a necessity," says Jim Ware, executive director of Berkeley's Fisher Center. Ware belongs to the Bay Area CIO Round Table and runs a separate roundtable for the Fisher Center's corporate sponsors.

As companies increasingly turn to outside contractors and multiple vendors to buy rather than build IT solutions, Ware explains, exchanging information with peers can help CIOs make better business decisions. "It's not like the old days when the saying was 'Buy IBM and you won't get fired,'" he says. "At these roundtables, you are hearing about independent, validated choices from others who make the choices and have to live with them. [The meetings] can be of tremendous value to the busy, harried CIO."

To Join or Not to Join

While many CIOs find such exchanges useful, others question whether roundtable discussions are worth the time and investment needed to make them function effectively and are unconvinced of the worth of taking the time away from a hectic schedule to sit and talk with other information managers on a regular basis.

Donald St. Peter, director of process planning at Fidelity Investments in Boston, complains that roundtables and multiclient programs he has attended often lean too far in an academic direction and spend too much time discussing philosophy. "Help me solve my business problems today," he says.

And Vince Barriero, vice president of IS at the Kendall-Jackson Winery in Santa Rosa, Calif., says that when he needs information from a fellow IS executive, he simply calls one, even if they have never met. "I have never been refused information, and I have never refused to help someone else," Barriero said. "I also get together informally with other CIOs for lunch or after hours now and again. The roundtables can be good for networking, but the ones I have gone to have been more social in nature and less useful for business."

John McCabe, vice president of information systems at Teradyne Inc. in Boston, is not yet sure if roundtables are worth the time and effort they require but is on the lookout for a useful one nonetheless. "Everybody's time is so valuable," he says. "What I keep struggling to find is a peer group that can talk about a particular subject at a low level of abstraction. We are always looking for good benchmarking, but often at these things people are sharing solutions that are just not applicable or actionable for me—just not what I would do in my reality."

But proponents argue that well-organized and thoughtfully planned roundtables offer members vital advice and case histories from peers. When they meet regularly, the members form an intimacy not possible at once-a-year conferences or forums. This means members are often quite candid about such issues as true cost of ownership for projects and return on investment for rollouts—crucial information for a manager attempting to chart a course on, say, a large salesforce automation implementation. The most successful roundtables pick topics months ahead of time and assign members to take over plans for a presentation. Networking and contacts come as a side benefit; the true value of roundtables

PHOTO LEFT BY KENT HANSON; PHOTO RIGHT BY WALTER CALAHAN

Tips for Setting a Roundtable

Here are some qualities that make a good and useful roundtable

- Members should vote on a list of topics and technologies they plan to tackle far ahead of time. Then agendas should be set, and members should take ownership of specific topics and be responsible for giving the initial presentation.
- A person or organization, such as a vendor, consultancy or university, needs to commit to "owning" the roundtable. The sponsor might do anything from making sure mailings or e-mail messages are sent to remind members of meetings to catering the meetings. Volunteer-run, ad hoc roundtables rarely last long.
- Make sure members have "take-aways" from meetings, in the form of handouts or reports. Information managers may take notes during meetings, but they seldom have the time later to put them together for distribution for their own staffs or to share them with other upper management.
- Keep the membership at a high level so that members will be motivated by the peer aspect of the group's makeup. Don't allow members to send underlings to participate in group discussions, unless roundtable members are comfortable with this practice.

–M. Blodgett

emerges from knowledge that members can apply to their own operations.

An Array of Roundtables

CIO roundtables exist in many forms. Universities, for example, often organize roundtables that are primarily research-focused. CIOs who eschew industry gurus and academics sometimes form their own groups, preferring to focus on peer discussions. In more market-driven cases, vendors or consultants might sponsor roundtables to give them a chance to pick the brains of IT managers. And some roundtables benefit from a combination of these characteristics.

Boston University's School of Management runs a roundtable, called the Systems Research Center, which researches policies, technology and trends in information systems and their impact on organizations.

John Henderson, professor of information systems and director of the center, says the 20 or so members come from an array of international Fortune 100 companies, including Xerox Corp., Swiss Bank Corp. and The British Petroleum Co. PLC. Almost all of the center's $1.4 million budget comes from dues paid by the members' companies, which range from $25,000 to $75,000 annually for different levels of membership and intensity of involvement.

Members of BU's group belong to smaller "workgroups" that research pressing IT issues such as knowledge management, business and technology strategies, managing and evaluating technology investments, and the sociological effects of technology on employees. The groups then conduct workshops based on their findings.

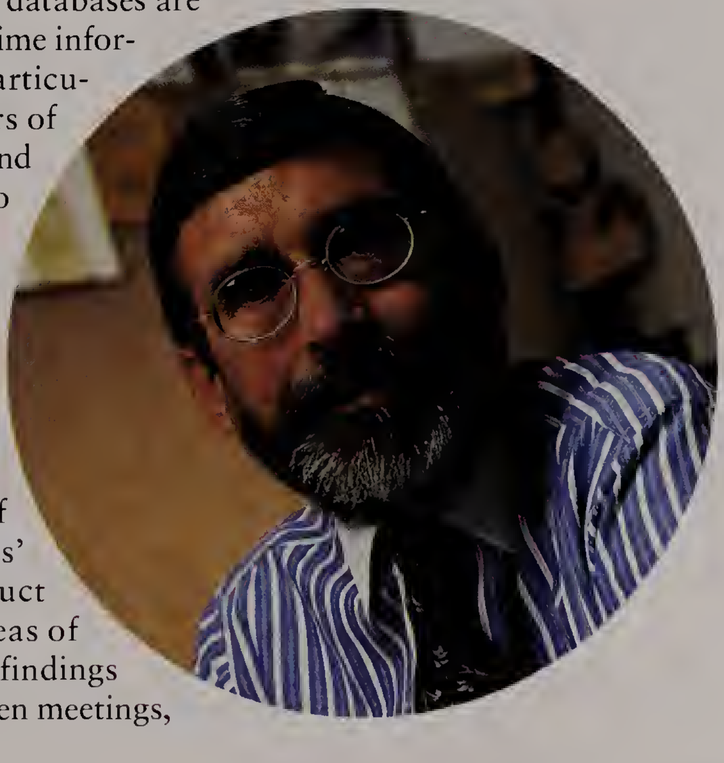
"Our members are not passive. They are proactively involved in a piece of research and they can really drill down into an issue," Henderson says. "The research we generate is of real value to the members and later, after we publish the research, to the public."

James Kinney, vice president and CIO of Kraft Foods Inc. in Northfield, Ill., represents his company at BU's Systems Research Center as well as at two roundtables. "[Henderson's] group has been particularly active on knowledge management, which has been very interesting," Kinney says. "The benefit of a group is directly related to the quality of its participants, and the quality of the members in the BU group is high."

Because members of the BU center are scattered around the world, the group has begun to rely more on the Web to share information, Henderson says. Using a password, members can access current working papers on the center's Web site. Discussion databases are maintained for real-time information exchange, particularly among members of the working groups, and the Web page is used to pass documents back and forth. The entire center membership meets in person twice a year; the working groups generally meet four times annually, and the center staff often visits members' companies to conduct research, discuss areas of interest and go over findings from projects. Between meetings,

"We have found the council to be a good vehicle for helping people to coalesce some projects."

–Alan Balutis



the group makes extensive use of videoconferencing so that workgroup members can communicate with each other and stay updated on the progress of various projects.

Outside of academia, federal government CIOs have formed a peer group that excludes both industry gurus and academics. After Congress passed the Information Technology Management Reform Act (known as the Clinger-Cohen Act) last year, requiring federal agencies to appoint CIOs to manage their IT budgets, CIOs and deputy CIOs of executive agencies formed the CIO Council (see "Administrative Progress Report," *CIO*, July 1997), which functions as the main interagency IT forum. The council members meet monthly to share information on such issues as year 2000 compliance and IT infrastructure.

"We have found [the council] to be quite a good vehicle for communication and for helping people to coalesce some projects," says Alan Balutis, Deputy CIO of the Department of Commerce. Balutis, chairman of the council's Outreach Committee, says the council hopes to link government CIOs with private sector information managers in similar industries. For example, the Department of Health and Human Services CIO might exchange ideas with a CIO from the health-care industry.

> **"The benefit of a group is directly related to the quality of its participants."**
>
> *–James Kinney*

PHOTO BY FURNALD / GRAY

One roundtable that focuses less on practice sharing and more on having an impact on technology is The Black Forest User Group. An international group comprising information managers from companies such as General Motors Corp. as well as vendors, consultants and academics, the group aims to influence company and government policies as well as technology. Black Forest, which has no formal home base, started out as a groupware end user forum with a few academic members and a limited number of vendor presentations, according to group spokesman Jock Gill, a consultant and a principal at Penfield Gill Inc. in Medford, Mass., which organized the roundtable. The discussions initially focused on workflow and Lotus Notes implementation issues, Gill says, but constantly evolve to include newer issues such as network security and the impact of electronic commerce on workflow and document management. Involving vendors proves important because the members believe their own success "is intimately tied to the [ability] of the vendors to understand their needs," Gill says. "They share with the vendors their must-haves and nice-to-haves, and they hope to have an impact on what the vendors produce."

The Bay Area roundtable is also run by a consultancy, Interim Technology, which suggests agenda topics and picks the brains of the CIO members. Edward D. Solomon, a senior vice president of Interim who coordinates the roundtable's meetings, says the company ensures that the makeup of the group never includes members' direct competitors, thereby encouraging candid discussion of ideas and questions. Solomon is in charge of setting dates for meetings and coordinating logistics such as location, but only the members themselves vote on topics. The members, who pay no fee to join the group, also take turns leading discussions, often providing handouts and multimedia presentations for meetings, and hosting the two-hour breakfast sessions.

While the company is careful not to inject its own business goals into the roundtable discussions, Solomon admits that Interim, which runs a group similar to the Bay Area roundtable for Chicago-area CIOs, uses the sessions to gauge the interests and concerns of important information managers as a way of keeping in step with changes in IT. Some members also may at various times be clients of Interim. But members believe Interim's involvement is important precisely because the company has a vested interest in keeping the group together and in keeping the structure well organized. And they say Solomon keeps a low profile, sharing much of his own knowledge with the group without using the sessions for marketing purposes.

"If he spent time trying to sell his business, then no one would come," says Clorox's Williams. "But Interim's commitment keeps the group organized and functioning."

Members also value the mix of industries represented in the Bay Area group. Says Steven Steinbrecher, CIO of California's Contra Costa County: "I've always been a firm believer that the private and public sector have a lot more in common with each other than it appears, and

CIO

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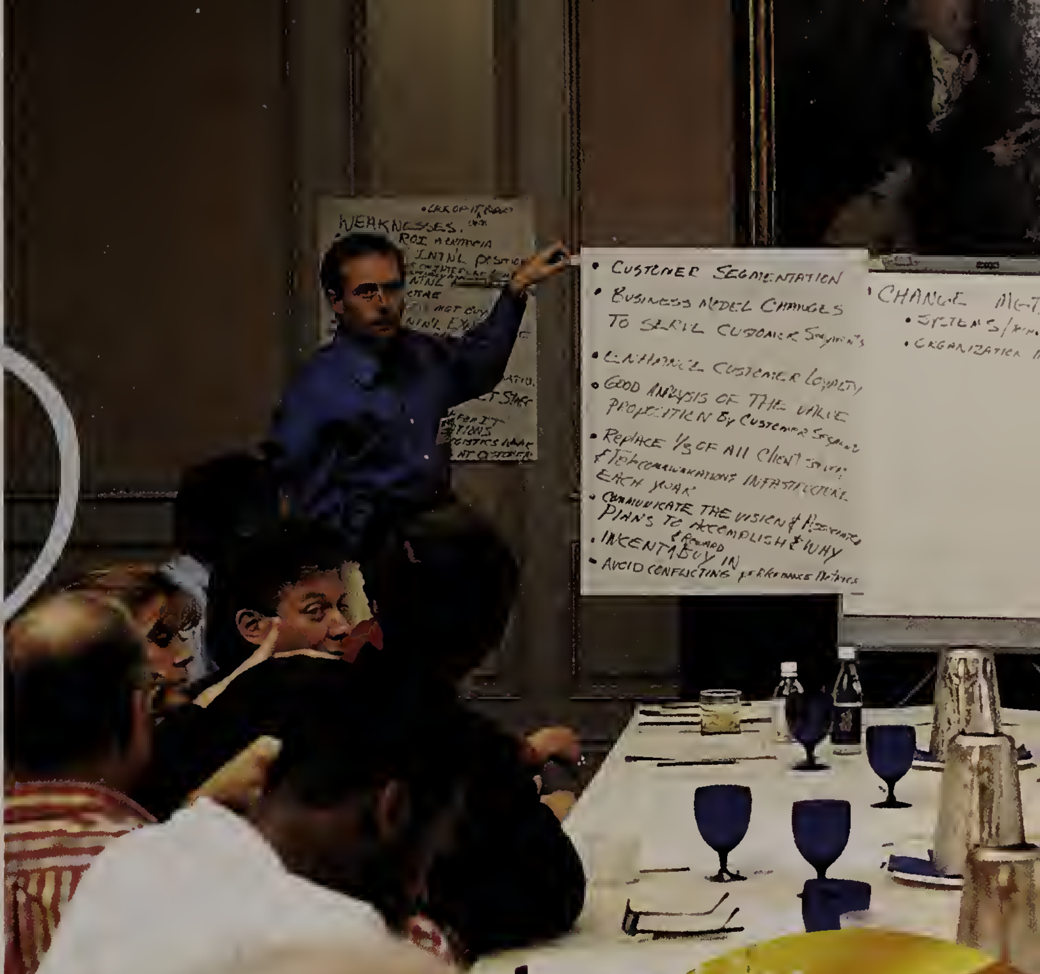
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Resource Box

Make a Reservation

Information on how to get seated at the roundtables mentioned in this article

Bay Area CIO Round Table

Contact: Edward D. Solomon at 415 439-7340
Membership: Bay Area CIOs and information managers from industry, government and academia
Cost: Free, except for the occasional cost of hosting the monthly breakfast meeting

The Black Forest Group

Contact: Jock Gill at 617 396-0492
Web site: *www.penfield-gill.com/BFG*
Membership: Approximately 30 international CIOs, vendors and consultants
Cost: No membership fee; cost of meetings varies based on the meeting location

The Boston University School of Management Systems Research Center

Contact: John Henderson at 617 353-6142
Membership: 22 CIOs from companies worldwide
Cost: $25,000 to $75,000 annually, depending on membership level

The Breakfast Roundtable

Contact: Ray Epich at 630 645-8932
Membership: 32 Chicago-area CIOs
Cost: Free

In addition to these groups, national IS organizations such as **The Society for Information Management** and the **Information Management Forum** sponsor discussion sessions for CIOs. For a more extensive list, see "Mission Impossible," *CIO*, Oct. 15, 1996, or view the article online by visiting our archive at *www.cio.com/archive*. You can also visit our Executive Resource Center at *www.cio.com/CIO/rc_main.htm*.

this group bears that out." In the past year, the group has discussed such pressing topics as year 2000 compliance, the Telecommunications Act of 1996, IT strategy and architectures, Java, and the difficulties of hiring, training and retaining IT staff in today's red-hot employment market. Steinbrecher found a recent discussion on client/server applications particularly interesting. His staff was in the process of implementing a client/server system for human resources and payroll, and Steinbrecher says he was "scared spitless" that the project might fail. But he took heart after hearing peers discuss how they handled the same problem.

"I brought back the handouts from the session on client/server hosted by Bank of America, and my staff and I were pleased to see that we were on track," he says. "Sometimes the group can [validate] your own decisions."

Keep the Roundtables from Turning

Despite the best intentions of their organizers, many roundtables fall apart when members stop feeling that the meetings have value. That feeling can be sparked by many circumstances, including a lack of specific agendas, topics that aren't relevant to most members or a poor mix of members from companies of different sizes.

"Sometimes CIOs from larger companies don't feel that what is going on at a smaller IT shop is of much interest to them," says Ray Epich, a former CIO at Northwest Industries in Chicago (now part of Fruit of the Loom Inc.), who currently runs Interim's Breakfast Roundtable in Chicago, which is cosponsored by the University of Illinois at Chicago Center for Research in Information Management. "That is where the skill of the moderator comes in. You have to be good at keeping things moving."

A major downfall of roundtables is having CIOs or leading information managers send subordinates to meetings. The practice has a domino effect: If the CIO from company X comes regularly but is uninterested in hearing about company Y's best practices from a lowly systems manager, he'll begin to lose interest himself and will send in his seconds in his place.

"It's really [difficult] to keep CIOs interested," says the Fisher Center's Ware. "If they start regularly sending subordinates, that can really ruin the balance and take away some of the value."

But if organizers and participants address those problems head-on, roundtables can provide CIOs with a unique and valuable perspective on an industry that seems to be in permanent flux. Wayne Brown, director of information services at CF Industries Inc. in Long Grove, Ill., which manufactures chemical fertilizers, says his involvement in Interim's Chicago-area roundtable as well as roundtables with the Society for Information Management (SIM) has been invaluable. "Sometimes what people are discussing is of no interest to me, but more often it is very relevant," says Brown. "For instance, I've gotten a lot out of our discussions of year 2000 compliance as well as productivity and quality issues. I always come back with extensive notes."

And Interim's Chicago roundtable recommends these two hard and fast rules to ensure enjoyment, says Epich: "Get them out of there by 9 a.m., and make sure the breakfast is full of cholesterol."

Senior Writer Mindy Blodgett can be reached at mblodgett@cio.com.

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Solutions Spotlight

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Reliance for Security and Flexibility

Philippines Social Security System relies on the strength of PATROL to manage its distributed computing system

When the Philippines Social Security System (SSS) decided it needed a strong tool to manage the distributed Oracle databases and Unix servers across its nine fully functional data centers, it chose the PATROL product from BMC Software.

"Our aim was to stop the IT department from getting trapped in a cycle of systems failures which commonly occurred due to database errors and crashes. In addition, our huge database of applications, systems resources and files needed automated enteprise-wide monitoring and coordination along with proactive systems management to analyze and control the performance of our distributed computing environment," says Tony Maralit, manager, database administration group, SSS.

The SSS evaluated various products and found, with the exception of PATROL, they did not support all multiple platforms in the organization. In particular, PATROL was the only evaluated product that could support SSS machines running on DEC Ultrix.

"With PATROL's multi-vendor support, its ability to improve management efficiency and speed up system maintenance, through the automation of many routine tasks, it was the natural choice," Maralit explains. The SSS also took into account the strong local support and the technical expertise that would be provided by BMC Software's distributor Leverage Systems Technologies; and that with PATROL's product-specific modules, time and effort required to train staff would be substantially reduced.

The 16 million members of the government-owned SSS access a range of financial services, such as housing, salary, and stock share loans, through 54 branches across the country. Of these, nine branches serve as fully-functional data centers.

The results with PATROL implemented were immediate. Reduced downtime led to improved customer service and heightened staff productivity. Costs relating to technical support were reduced too as the SSS no longer had to rush support personnel to various branches to correct system errors and restart crashed systems.

PATROL product-specific expertise for monitoring and automating processes, also leveraged the technical skills of the administrative staff and helped reduce training requirements, as well as administrative overheads. Reporting also became more efficient as PATROL kept automatic and regular track of network and database activity. PATROL easily addressed the issue of central monitoring of remote Oracle databases as it automated and centralized the control of critical elements.

Currently, PATROL consoles are running on the organization's SCO Unix, DEC/OSF1 and IBM RS/6000 machines. Its agents are running on SCO Unix, DEC/OSF1, IBM RS/6000, Sun Server and DEC Ultrix machines. All databases and Unix machines in the remote offices are monitored centrally from the head office using PATROL. With proactive systems provided by the product, only two database administrators and two systems administrators are needed at the head office to monitor and control the databases and Unix machines in all nine offices.

The SSS is now planning to establish a back-up and recovery center with an additional license of PATROL. "To be successful in a changing global marketplace, an organization must be flexible and able to address new business opportunities," explains Maralit. "Hence, each SSS data center has its own database to help it respond quickly to the local environment.

"PATROL is event driven and can manage virtually any application providing a pragmatic alternative to centralized corporate databases. As a result, we now have PATROL-based management control from the head office," says Maralit. "We would like to have the same flexibility and support for the back-up and recovery center, which is why we have requested another license."

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Emerging Technology

THE STATE OF THE ART,
NEW PRODUCTS
AND STAYING AHEAD
OF THE CURVE

Edited by Elaine M. Cummings

Storage Starts to Sizzle

The proliferation of data has many an IS department scrambling for greater capacity

BY DEREK SLATER

ILLUSTRATION BY ANSON LIAW

DATA STORAGE COMMONLY RANKS SECOND on the average trade journalist's list of boring topics (right behind middleware, in case you're wondering). For the average data processing manager, though, any news pertaining to better, cheaper, faster storage makes for front-page headlines. According to industry gurus at Boston-based Yankee Group, storage is the biggest line item on IS budgets. Warehouses, marts, EDI/OLAP/ROLAP/business intelligence systems and one-to-one marketing databases are creating so much data that many IS departments are struggling to find greater storage capacity.

Fortunately, vendors have been working hard to come up with ways of creating that capacity. Most of the advances in the storage arena are still evolving, but various vendors are building systems that are faster, easier to manage or of higher capacity than the systems currently available. Getting all three improvements in a single technological bound is rare; usually you have to compromise in one area to gain a significant jump in another. The following capsules offer a quick look at some of the hottest technology areas in data storage.

Fibre Channel. The Fibre Channel Standard is a protocol for connecting host systems and servers with storage subsystems, in the same way older protocols such as IDE (Integrated Drive Electronics) and SCSI (Small Computer System Interface) do. It offers raceway speeds for data transfer—1GBps—promising superfast access to the corporate data coffers. Fibre Channel is on the way to widespread acceptance, according to Robert Katzive, vice president of market research firm Disk/Trend Inc. in Mountain View, Calif. And companies ranging from mainframe storage Goliath EMC Corp. to startups like San Jose, Calif.-based Gadzoox Networks Inc. are announcing Fibre Channel products. A Fibre Channel hub can route IP network traffic as well as other I/O data in other formats (such as SCSI) shuttling to and from servers. That means users can consolidate network and storage traffic on a single pipeline and plug Fibre Channel devices into existing storage architectures. As the common SCSI standard continues to evolve and offer increasing bandwidth, the speed of Fibre Channel may not be its greatest selling point. Just as important is the fact that Fibre Channel data can travel much greater distances than SCSI data without requiring a repeater. "Most [users] can't fill up the bandwidth of Ultra-SCSI. But there's great interest in Fibre Channel because it gets rid of the distance limitation of SCSI, so it's great in the campus environment," says Anne Murphy, vice president of

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Leaders in I/O Technology

The demand for device driver portability between operating systems and host platforms, combined with increasing requirements for intelligent, distributed I/O processing has led to the development of the Intelligent Input/Output, or $I_2$0 specification. BMC Software and Intel Corp. are working closely with the $I_2$0 Special Interest Group (SIG) to bring $I_2$0-compliant technologies to market, including integrating PATROL Management solutions with the Intel i960RP I/O processor.

"The importance that the Intel/BMC relationship brings to the market is that BMC innovation in I/O technology naturally makes them a leader in this collective new I/O-centric industry," states Alan Steinberg, Director of New Business Development, Connected P.C. Division at Intel. "Currently we have companies coming in from the desktop and from other areas of the industry that don't necessarily have the Enterprise experience BMC Software has to deal with the type of I/O that is needed in what could be called the new 'open mainframe' world."

Steinberg envisions a world where Microsoft will provide the main operating system, Intel will provide the hardware architecture and BMC Software will contribute the key $I_2$0-compliant management technology. BMC Software's role will be to help architect what Steinberg calls the "highly available, highly manageable open system mainframe" on the I/O space.

Bob Beauchamp, Vice President of Strategic Marketing and Corporate Development for BMC Software, agrees. "The pervasiveness of the i960 chip in the Windows NT and NetWare environments, combined with BMC Software's PATROL technology, will empower customers with unprecedented management and monitoring capabilities from the application to the motherboard."

Clearly, the ability to gather statistics regarding I/O is a great step forward. The PATROL Application Management Suite completes the picture by correlating I/O statistics with the applications that are utilizing the I_2O components or sub-system. This allows unprecedented optimization capabilities, such as automated load balancing, cache reallocation, and the rerouting of network traffic. All of these capabilities can be performed on demand and are based on the performance requirements of the applications. Currently, no two vendors come as close as Intel and BMC Software in providing this comprehensive approach to I/O processing and manageability.

"We've moved into a new paradigm where I/O is as important as the central CPU technology," states Steinberg. "This shift will allow BMC to proliferate its management product line in the open systems environment. Pairing Intel I/O technology with PATROL is just the very beginning. It's the first product of many, as this new I/O-centered technology emerges into the marketplace, and we think it's going to be an exciting ride."

Intel

Corp. is integrating PATROL® management technology into the i960RP® I/O processor in order to provide the direct management capabilities for I/O subsystems customers are asking for.

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marketing at Storage Computer Corp., a RAID (redundant array of independent disks) vendor in Nashua, N.H. The fiber medium itself is also tougher and more physically resilient than other kinds of wiring.

I2O. I2O is another technology standard adding a new dimension to the link between servers and storage. The basic goals of I2O are to offload I/O processing tasks from the CPU (cutting out one of the biggest bottlenecks in computing) and to eliminate dependency on proprietary drivers for storage subsystems, making it easy to mix and match various storage and server products. The I2O specification is aimed at systems with Intel-class processors.

The architectural concepts of I2O have been around for a long time in the midrange market, although in the beginning all implementations were proprietary, says Robert Gray, a research manager at International Data Corp. in Framingham, Mass., a sister company to CIO Communications Inc. He notes that network and storage traffic tend to choke high-end Intel processors, which lose thousands of processing cycles when interrupted by an I/O request, so offloading those requests is becoming increasingly critical. I2O's architecture is media-independent, so it can be applied to Fibre Channel solutions as well as SCSI systems. Chip maker Qlogic Corp. in Costa Mesa, Calif., for instance, has announced an I2O-compliant Fibre Channel processor that can queue more than 1,000 I/O requests without bogging down the CPU. Once that sort of processor is built into storage systems, the server and the storage system will both see trumped-up performance.

Network-attached storage. A network-attached storage device, or "storage appliance," is a storage box that manages itself; you simply plug it into your network, assign an IP address and let the servers know it's there. All servers on the network can use the same box. Because journaling, backup and data compression can be built into the system—a feature called embedded storage management—network-attached storage has the potential to reduce the burden of network administration.

Code For Hire

Organizations typically rent office space, vehicles and computers. So why shouldn't they rent software, too?

THE RENTABLE SOFTWARE concept has blossomed over the past several months, giving organizations fast access to a variety of groupware applications without requiring a major upfront investment. To tap a rentable application, one simply directs a standard Web browser to software located on a provider's site.

RENTABLE SOFTWARE

Numerous software rental ventures have appeared online since early 1997. Changepoint International Corp. in Richmond Hill, Ontario, for example, operates Involv (*www.involv.net*), a service that allows users to collaborate on various types of business projects in a secure online area. The company's current and planned project management applications include issue management, document management and change control. ErgoTech (*www.ergo-tech.com*) is a New York City-based software developer that creates Web-based sales automation, contact management and lead tracking applications.

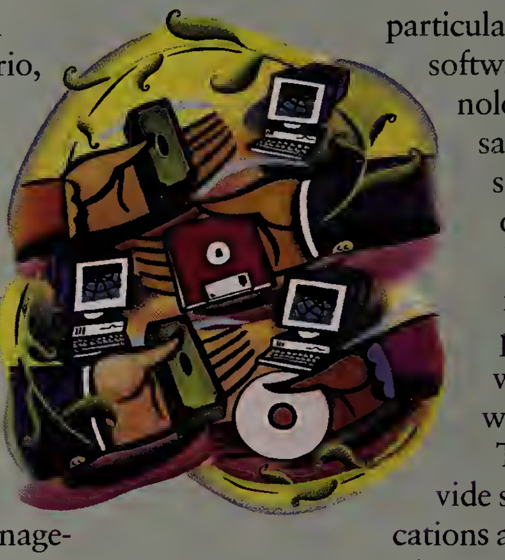

ILLUSTRATION BY ANSON LIAW

Lotus Development Corp. is heavily involved in the rentable software field. The IBM subsidiary offers Instant Teamroom, a Web-based groupware application that organizations can rent through Houston-based Interliant Inc., NetCom On-line Communications Services Inc. of San Jose, Calif., and other ISPs. Lotus also offers Domino Instant Host, a tool that allows software developers to build different types of rentable applications based on the company's Domino platform. (Changepoint and ErgoTech both offer Domino-based applications.)

Instant Teamroom and related services are aimed at small and midsize organizations that don't have the internal resources to install a complete groupware infrastructure. But Steve Brand, senior director of Lotus's Hosted Internet Services division in Cambridge, Mass., says the technology can also benefit large enterprises, particularly because it allows software access to be easily granted to customers and business partners as well as employees.

"Users aren't required to have a particular type of client software or server technology on-site," he says. "Rentable software allows organizations to bring individuals into a groupware project who wouldn't otherwise have access."

The ability to provide specialized applications at a reduced cost is another potential draw for larger organizations. Vendors have priced their rentable products at roughly between $10 and $45 per month per user, giving organizations access to a variety of tools at affordable prices. "By eliminating the big upfront cost, organizations can give small workgroups access to specialized applications that would ordinarily be too expensive to implement," says Brand.

On the downside, rentable software forces organizations to move potentially sensitive data across the Internet for storage off-site. Training small workgroups can also drive up costs, while sluggish Web performance may frustrate users accustomed to fast, on-site servers.

–John Edwards

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All performance information is estimated, based on user reports.

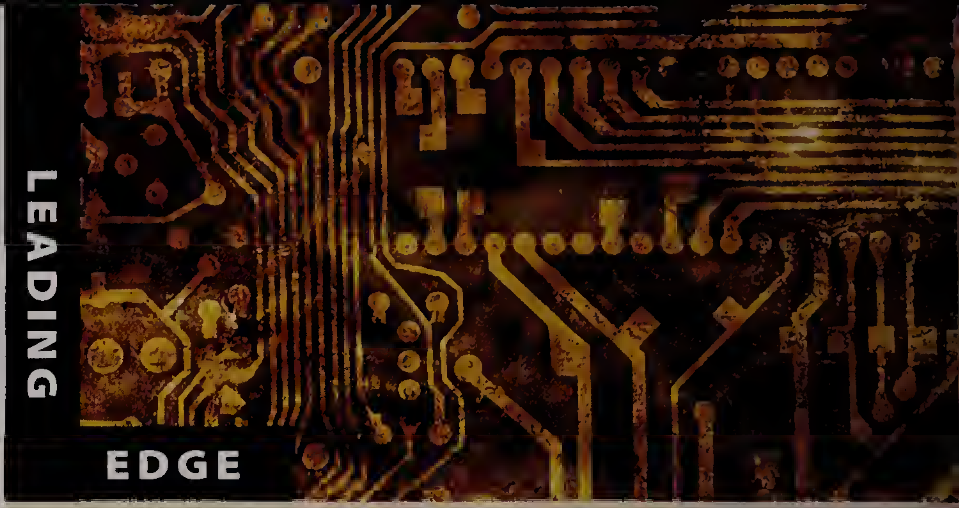
Emerging Technology

Currently, a number of players in this field exist, including two Santa Clara, Calif., companies, Auspex Systems Inc. and Network Appliance Inc. on the high end. The competition is likely to heat up as demand rises; Katzive says the market for plug-and-play network storage may triple over the short term. More companies will likely head into the market because vendors can now buy storage management software off the shelf from companies like Somerset, N.J.-based Programmed Logic Corp. rather than writing their own, lowering the barriers to entry. But what users gain in convenience they may lose in performance: Data retrieved from a network appliance travels over standard LAN bandwidth rather than over SCSI or another direct server-storage connection, slowing its time of arrival. "There are ways around [the performance hit], like ATM on the LAN, but a dedicated 40MB channel is definitely faster than a shared channel," says Murphy.

Data movers. Tom Fogleman, manager of storage management for Lockheed Martin Enterprise Information Systems in Orlando, Fla., says one of the most useful devices in his arsenal is a "transparent data mover" from Amdahl Corp. Earlier this year, Fogleman's group needed additional direct access storage device (DASD) capacity in a hurry. Buying additional disk space is not too complicated; what's tricky is shuffling data from one physical device to the other, particularly in cases like Fogleman's, where he had "about 500GB of highly accessed, volatile IDMS [integrated data management system] volumes and a very sensitive [internal] customer." Business units are not generally in favor of shutting down operations for a few days to swap storage devices. Amdahl's product moved Fogleman's data onto new DASD space in two-and-a-half days without disrupting service. IBM Corp., Tandem Computers Inc. and others offer similar products or services.

Virtual tape storage systems. There is good news for big-iron users with multigigabyte storage demands. Virtual tape storage systems combine DASD and a tape library into a single, coordinated unit. Typically, retrieving data from a library is extremely slow because the system's robotic arm has to select and mount the correct tape. The idea behind virtual tape storage is keeping recent or commonly accessed information on DASD for high-speed retrieval; as data ages and the number of accesses declines, the storage system automatically migrates the information from the DASD component to tape. All this is transparent to the user. Virtual tape systems also use tape storage capacity more efficiently than regular taype systems, which typically reduces the amount of tape users require. "Tape is becoming really expensive, and it eats an awful lot of floor space," says Fogleman. "Today, it's very difficult to use 10GB tapes [efficiently]." Fogleman sees virtual tape systems as a way to help Lockheed cut down its tape dependency. IBM, Storage Technology Corp. in Louisville, Colo., and Sutmyn Storage Corp. of Santa Clara, Calif., are all creating virtual tape storage products, each with a significantly different approach.

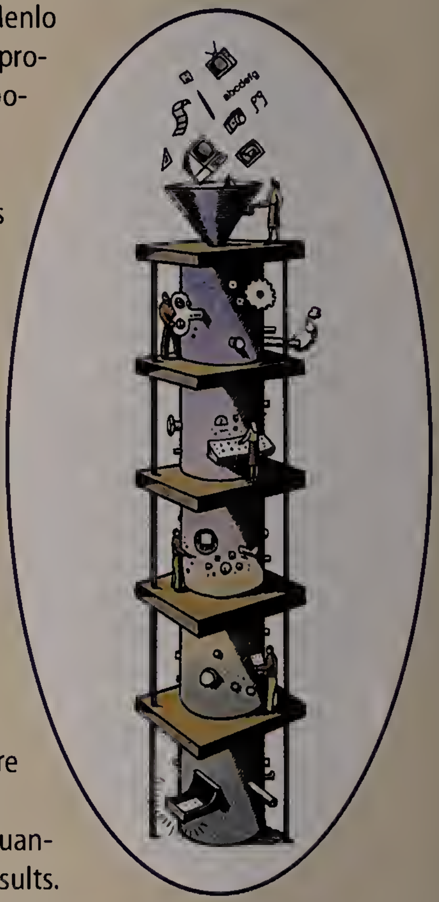
Near field recording. This new technology essentially



What's Going On Here?

FEW THINGS ARE MORE AGGRAVATING than deploying a custom application to test subjects within a company and then trying to discern whether they're actually using it. How they're using it and what stumbling blocks they're running into would be helpful to know too, of course. But it's a hassle both to check up on the subjects and determine usage trends from anecdotal evidence.

Aqueduct Software Inc. of Menlo Park, Calif., has automated the process with a new software component it calls the **Aqueduct Profiler**. It's one of those palm-to-the-forehead products that's so logical you wonder why no one has come up with it before. Embedded in the application, the Profiler measures myriad statistics: hours run per day, actual usage per day, feature usage and crashes per operating system, among others. It then uses e-mail to transmit the information automatically to the developers, who can use the Profiler's analysis tool to determine whether the software is being used the way they intended. Suddenly, you've got quantifiable, rather than abstract, results.



For instance, if you instituted a feature that you think makes the application intuitive, but the Profiler reveals no users, it's probably not as easy as you thought. Best of all, Profiler can reveal almost immediately—rather than in the usual two to three weeks—whether testers are actually banging on the application or ignoring it.

To contact the company, call 650 463-8700, or visit its Web site at *www.aqueduct.com*.

Squeeze Play

MOST ATTEMPTS AT IMPROVING Web performance have been based on increasing available bandwidth. But what if there were a way to overcome bandwidth bottlenecks by shrinking files?

Now there is. RMX Technologies Inc. has announced **Rush**, an encoding technology that shrinks files by as much as 95 percent, speeding file transfers and breaking the bandwidth bottlenecks that plague information access via the Web. In fact,

ILLUSTRATION BY RANDY LYHUS / SIS

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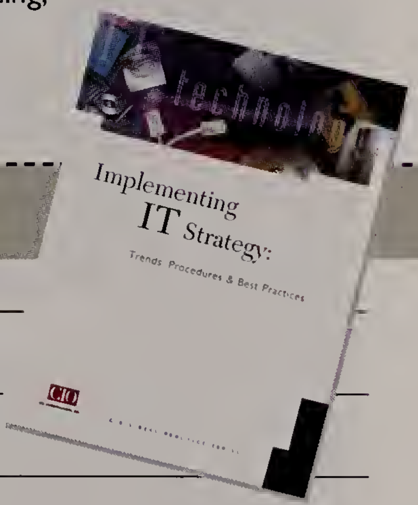
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promises to store more data in the same amount of physical disk space as hard disks—providing greater "areal density"—by combining elements of hard-disk and optical storage. TeraStor Corp., a San Jose, Calif.-based startup company at the forefront of near-field technology, has received a lot of attention since its founding in late 1995 by Jim McCoy, a storage industry veteran who also helped found both Quantum Corp. and Maxtor Corp.

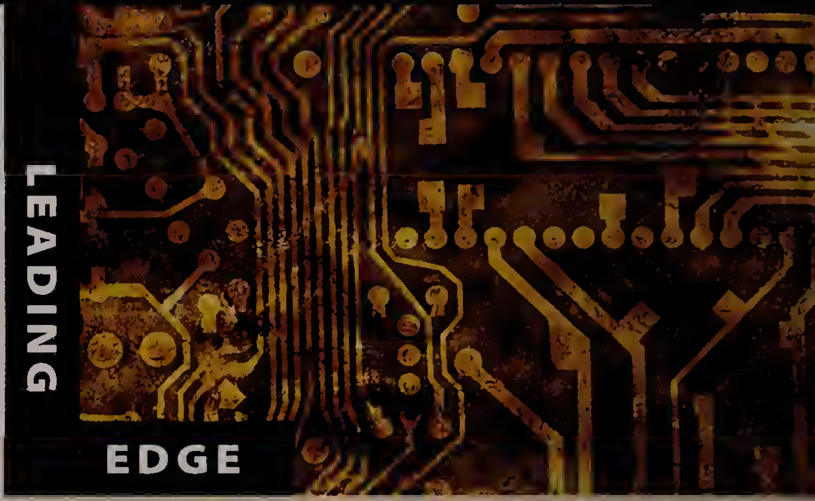
TeraStor's near-field architecture includes a "solid immersion lens," a technology created at Stanford University that focuses a laser beam on a smaller area than previously possible. Data is then stored magnetically on this tiny spot. The lens is part of a flying optical head that does not come in contact with the recording surface in reading or writing. TeraStor will license its technology and leave the drive production to others; 3M spinoff, Oakdale, Minn.-based Imation Corp. has inked a deal to produce the media. Real products aren't expected until the middle of 1998. Until near-field systems prove otherwise, the yellow flag of caution is again in the area of performance. "If they are successful in bringing it out as a product, they'll probably have an optical drive that can compete well with rigid drives in capacity. It isn't clear if the performance will be equivalent," says Katzive. Unless the speed surprises everyone, IS managers should think of near-field recording systems as likely candidates for secondary storage systems or near-line systems, Katzive says.

> **The volume won't go up until the cost comes down and vice versa. "It's a chicken-and-egg situation, where the chicken is on a crutch."**
>
> –*Robert Katzive*

Traditional optical storage itself has never gotten off the ground in the way original prognosticators anticipated, precisely because of performance limitations. According to Katzive, the optical market is "relatively static because the drive producers haven't been able to get the volume to drive the price down." The volume won't go up until the cost comes down and vice versa, he says. "It's a chicken-and-egg situation, where the chicken is on a crutch." Perhaps that should provide a measure of caution about near-field hype.

Spectral holographic memory. This one is *way* out there, so don't expect to unwrap a holographic drive from CompUSA this Christmas (or perhaps this century). Spectral holography is an emerging technology that promises significantly greater areal density than magnetic or current optical drives dream of. Rather than using a magnetic storage technique where each given unit of physical space records a single bit of information, holographic storage uses media that is sensitive to different frequencies of light. By changing the frequency of the laser reading the media, it is possible to detect several bits of information recorded within the same unit of physical space. The basic concept has been around for several years, but a great deal of research and development has yet to be done before products become viable. However, with the number of players in pursuit of holographic storage, both in industry and academia, it seems reasonable that such products will eventually find their way into the corporate storage hierarchy. For a complete explanation, visit *www.optitek.com/hdss_tutorial.htm* (a tutorial on volume holographic digital data storage) or the Mossberg Research Group at the University of Oregon's physics department in Eugene, Ore. (*opticb.uoregon.edu/~mosswww/Home.html*).

Senior Writer Derek Slater can be reached at dslater@cio.com.



certain types of files, such as CAD files and business presentations, can be transferred and viewed as easily as common Web pages.

The Rush encoding engine adapts to almost any data type. And because Rush files are encoded and not merely compressed, they can be scaled to fit any monitor while maintaining the original layout and formatting. "By incorporating Rush into a CAD or presentation file format, a salesman could give a complete business presentation using a Web browser in real-time, or an engineer could access an entire CAD library using a wireless Web connection," says Robert Moran, CEO of RMX.

For more information, contact the Ottawa, Ontario-based company at 613 749-1400, or visit the RMX home page at *www.rmx.com*.

All Four One

FOR LARGE COMPANIES with big IS departments and countless workstations, managing the various networked servers from one location via one keyboard and mouse seems like an obvious and practical solution. But new technology from Raritan Computer Inc. in Somerset, N.J., can help smaller businesses that may have fewer PCs but still need that kind of delivery. **Compu Switch** is a multichannel model that controls up to eight PCs from a single keyboard, monitor and mouse. Compu Switch uses Raritan's proprietary emulation technology, the Keyboard-Video-Mouse (KVM), which dedicates individual keyboard and mouse emulators to each PC. Compu Switch is based on Raritan's flagship product, MasterConsole, a KVM switch that controls up to 64 computers from one keyboard, monitor and mouse. Compu Switch supports a mix of PCs with PS/2 and serial mouse ports and features a 1.75-inch desktop chassis, a 1U optional rack-mount kit, hot-key commands, a front-panel selector and control buttons, and a user-adjustable scan function. Compu Switch is available through dealers, VARs and distributors for $595 for the four-channel model. A two-channel model and eight-channel model are also available for $385 and $895, respectively. Cables to connect PCs come in 6.5- and 13-foot lengths and cost $40 and $50, respectively. For more information, contact Raritan at 732 764-8886 or visit *www.raritan.com*.

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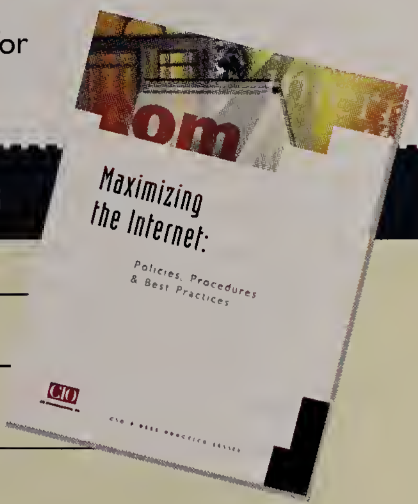

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Working Smart

MAXIMIZING THE PAYOFF FROM I.T.

Texas Health Resources' Automated Applicant Management System

THE INCREASE IN MANAGED CARE over the past decade has triggered wholesale changes in the health-care industry. Severe cuts in medical reimbursement have forced health-care facilities to take a long, hard look at ways to contain costs without compromising patient care. Texas Health Resources (THR), an integrated health-care organization in the Dallas/Fort Worth area that was formed recently following the merger of Harris Methodist Health System and Presbyterian Healthcare system, rose to the cost-containment challenge by reengineering the process for screening job applicants. By replacing its paper-based system with an automated program, THR dramatically reduced the time and cost involved in matching the right job candidates to open positions.

Vital Statistics:

- **Organization:** Texas Health Resources, Dallas/Fort Worth
- **Application:** Automated management system of employment applications
- **Technologies:** Human resources management software from InPower Inc.; National Computer Systems (NCS) Inc. optical character recognition software; Oracle Corp.'s relational database
- **Scope:** All HR professionals and line managers
- **Sponsors:** Chuck Irek, director of enterprise systems; Charles Prahl, human resources information systems team leader
- **Objective:** Reduce time needed to fill job openings; avoid hiring additional clerical staff; improve effectiveness of recruitment activities
- **Payoff:** Cut applicant screening process from 15 days to three; saved $750,000 in planned expenses; decreased paper usage by 28 reams a month

The new system—human resources management software from InPower coupled with optical character recognition software from NCS and an Oracle relational database—was developed by Harris Methodist before the merger. The system now gives THR a competitive edge in rapidly developing and deploying its workforce. In an industry that typically faces an annual turnover rate of 20 percent or more, the automated system allows THR to streamline the process of filling 3,400 job openings each year.

Before the system was implemented, Chuck Irek, THR's director of enterprise systems, says Harris Methodist was "managing paper, not data." All incoming applications were copied by clerical staff, distributed to HR professionals and manually reviewed against open positions. Applications that made the grade were again copied and sent to managers via interoffice mail.

With thousands of job openings each year, Harris Methodist desperately needed to reduce such paper-pushing. Early in 1997, the company went live with an automated applicant management system. Using automation to prescreen applications has reduced the time it takes to identify a qualified applicant from 15 days to a mere three, according to Charles Prahl, human resources information systems team leader.

The InPower system matches a position's required knowledge, skills, abilities and other characteristics with the applicant's self-identified skills, work history and education. That matching ability enables InPower to efficiently weed out approximately 1,250 applications a month.

Applications are scanned directly into the central computer and batched into the application management system daily. As a result, the company eliminated eight clerical positions that had been devoted to data entry, filing and record keeping. The company has also avoided hiring additional HR generalists to move the mountains of paperwork through the application process.

Traditionally, the applications of the remaining "potentially qualified" candidates were forwarded to hiring managers along with copies of the original paperwork. This paper chase amounted to 28 reams each month. With the savings in personnel and associated costs, the new system will help THR reduce expenses by $750,000 in its first year alone.

Irek cites an additional benefit of the automation. "When you have a very objective system, it helps you comply more carefully with EEOC regulations." Since specific requirements drive the system's prescreening criteria, there is no question of favoritism or bias when an application is rejected, Irek notes.

As the application process expands, this virtual encyclopedia of employee data will help THR review the competencies of its workforce. This information, in turn, will help THR develop personnel programs in response to new challenges in the health-care market.

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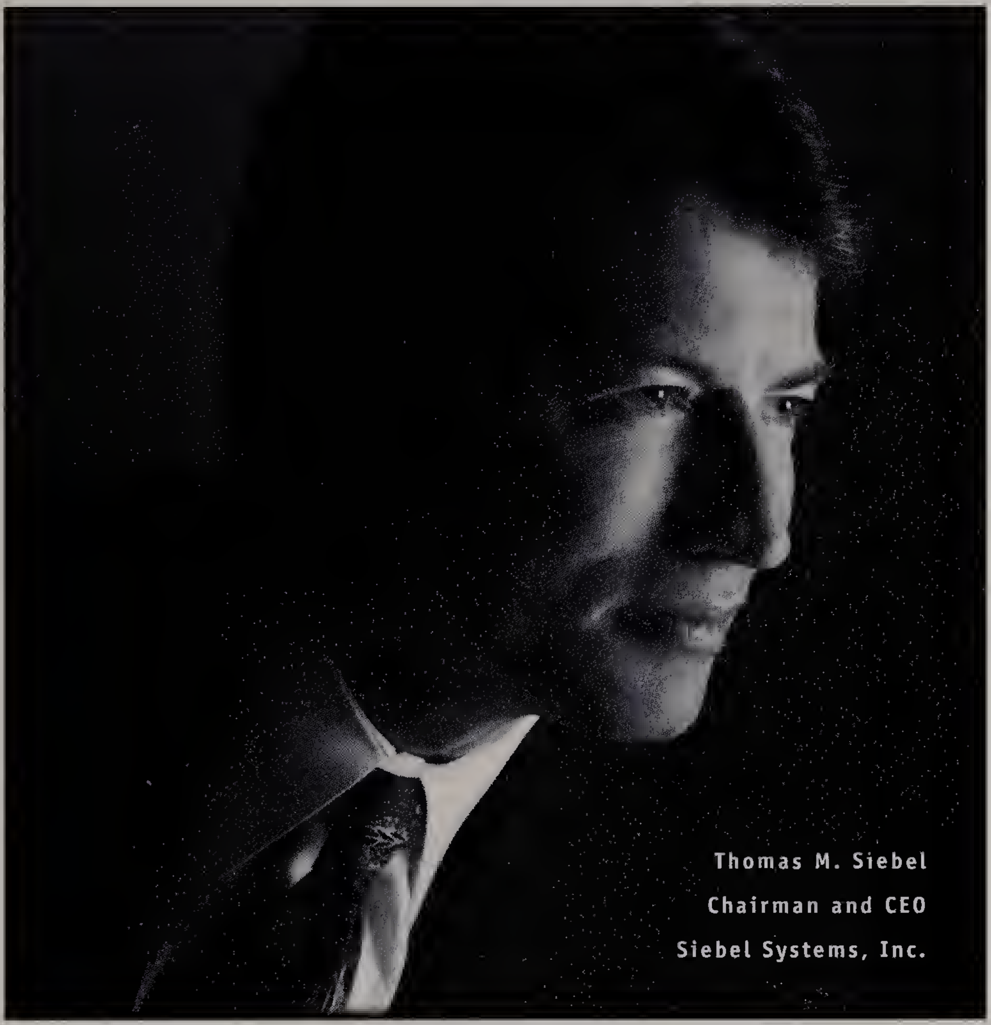

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